No Index Complete

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Middlesex Mechanics

AMERICAN

RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, *Editor.*

ASSISTANT EDITORS:

JAMES T. HODGE, *For Mining and Metallurgy.*
CHARLES T. JAMES, *For Manufactures and the Mechanic Arts.*
M. BUTT HEWSON, *For Civil Engineering.*

SATURDAY, JANUARY 5, 1850.

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During the past year, S. & P. have furnished several Iron Bridges for the Erie Canal, Albany Basin, etc. —and a large amount of Railroad Bridge Bolts, all of which have given the most perfect satisfaction.

They are permitted to refer to the following gentlemen:

Charles Cook, Nelson J. Beach, Jacob Hinds,	Canal Commissioners of the State of New York.
Willard Smith, Esq.,	Engineer of the Bridges for the Albany Basin.
Messrs. Stone & Harris, Mr. Wm. Howe,	Railroad Bridge Builders, Springfield, Mass.
Mr. S. Whipple,	Engineer & Bridge Builder, Utica, N. Y.

January 1, 1849.

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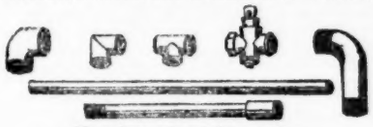

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President of the Newcastle Manuf. Co.

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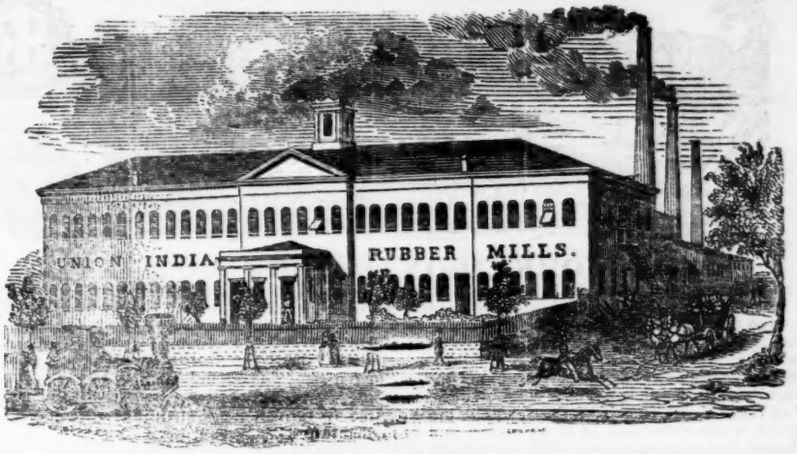

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MANUFACTURERS AND DEALERS IN EVERY VARIETY OF

GOODYEAR'S PATENT METALLIC RUBBER FABRICS,

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NO. 19 NASSAU STREET, NEW YORK.

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Beds,	Overcoats,	Life Preservers,	Mail Bags,	Camp Blankets,
Pillows,	Leggins,	Boat Floats,	Breast Pumps,	Travelling Bags,
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Together with *all new applications of the Patent Rubber*, which with Boots and Shoes, Packing, Machine Belting, Suspenders, Gloves and Mittins, Tobacco Wallets, Balls, Baby Jumpers, Elastic Bands, etc., etc., will be sold to the Trade at Factory prices.

*** All orders for special articles to be manufactured, should be accopanied with full descriptions and drawings.

October 20, 1849.

ETNA

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

☞ *Sole Manufacturers,* ☜

No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States.

☞ The Premium of the AMERICAN INSTITUTE was awarded to the *Etna Safety Fuse* at the late Fair held in this city.

November 3, 1849. 1y

RAILROAD
India-rubber Springs.

IF any Railroad Company or other party desires it, the NEW ENGLAND CAR COMPANY will furnish India-rubber Car Springs made in the form of washers, with metalic plates interposed between the layers, or in any other form in which they can be made; in all cases guaranteeing the right to use the same against any and all other pretended rights or claims whatsoever.

F. M. Ray, 98 Broadway, New York.
E. CRANE, 99 State Street, Boston.

May 24, 1849.

DEAN, PACKARD & MILLS,

MANUFACTURERS OF ALL KINDS OF

RAILROAD CARS,

SUCH AS

PASSENGER, FREIGHT AND CRANK CARS,

— ALSO —

SNOW PLOUGHS AND ENGINE TENDERS OF VARIOUS KINDS.

CAR WHEELS and AXLES fitted and furnished at short notice; also, STEEL SPRINGS of various kinds; and

SHAFTING FOR FACTORIES.

☞ *The above may be had at order at our Car Factory,*

REUEL DEAN, ELIJAH PACKARD, ISAAC MILLS, } SPRINGFIELD, MASS.

1y48

Iron Safes.

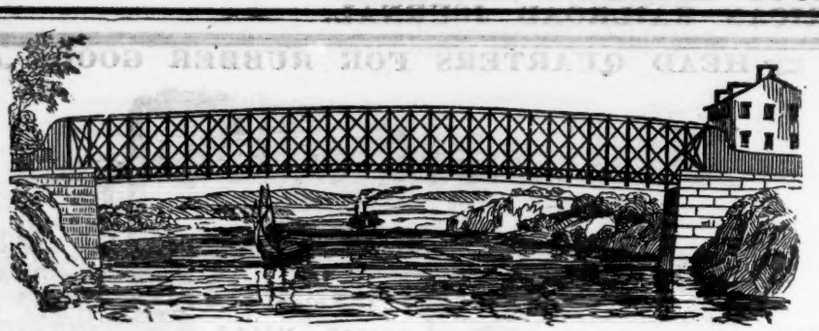
FIRE and Thief-proof Iron Safes, for Merchants, Banks and Jewelers use. The subscriber manufactures and has constantly on hand, a large assortment of Iron Safes, of the most approved construction, which he offers at much lower rates than any other manufacturer. These Safes are made of the strongest materials, in the best manner, and warranted entirely fire proof and free from dampness. Western merchants and the public generally are invited to call and examine them at the store of E. Corning & Co., sole agents, John Townsend, Esq., or at the manufactory.

Each safe furnished with a thief-detector lock, of the best construction.

Other makers' Safes repaired, and new Keys and Locks furnished at the shortest notice.

H. W. COVERT,
cor. Steuben and Water sts. Albany.

August 24, 1848.



NEW YORK IRON BRIDGE COMPANY.

The Bridges manufactured by this Company having been fully tested on different Railroads, by constant use for more than two years, and found to answer the full expectations of their most sanguine friends, are offered to the public with the utmost confidence as to their great utility over any other Bridge now known.

The plan of this Bridge is to use the iron so as to obtain its greatest longitudinal strength, and at the same time it is so arranged as to secure the combined principles of the *Arch, Suspension and Triangle*, all under such controlling power as causes each to act in the most perfect and secure manner, and at the same time impart its greatest strength to the whole work.

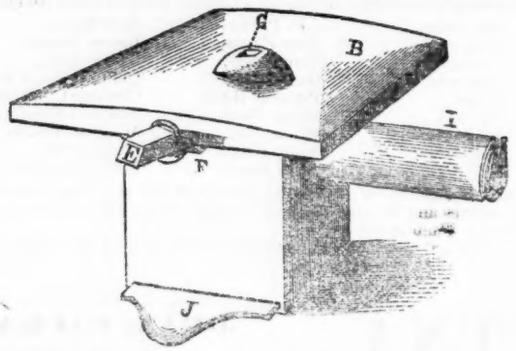
THE NEW YORK IRON BRIDGE COMPANY are prepared to furnish large quantities of Iron Bridging for Railroad or other purposes, at short notice, and at moderate prices.

Models, and pamphlets giving full descriptions of the above BRIDGE, with certificates based on actual trial from undoubted sources, will be found at the office of the Company, 39 Jauncey Court, Wall st., or of W. RIDER & BROTHERS, 19 *Nassau Street*, where terms of contract will be made known, and where orders are solicited.

M. M. WHITE,
Agent for the Company.

August 29, 1849.

E. Harris' Patent Rotary Blacksmith Tuyere.



LETTERS Patent were issued January 9, 1849, to E. HARRIS, of Springfield, for an Improved Rotary Blacksmith Tuyere. Since that time there have been some hundreds put in operation, giving satisfaction and full proof of superiority over all others.

This Tuyere is so arranged that by one movement it can be changed from the largest work to the smallest; at the same time the fire is changed in proportion, thereby making a great saving in coal. Words cannot convey the full merits of this Tuyere; nor is it deemed necessary to speak in disparagement of other Tuyeres, as every smith is capable of judging for himself, and will give merit where merit is due.

I will simply say that there has not been a single instance where I have had my Tuyere put in use but it has given full satisfaction, and is recommended by all who have used them, as being superior to any other ever introduced. I would invite all to give them a trial; and the names of those using them being given, I hope it may induce others to try them, as they recommend themselves.

Western Railroad Shop,	Springfield,	Mass.
" "	Pittsfield,	"
Connecticut val."	Springfield	"
" "	N. Hampton	"
Hartford "	Hartford,	Conn.
New Haven "	New Haven	"
Norwich and Worcester,	Norwich	"
N. York and N. Haven,	New Haven	"
Saratoga and Whitehall,	Saratoga,	N. Y.
Vermont Central,		
Hudson and Berkshire,	Hudson,	
L. Kingsley,	Canton,	Mass.
Hadley Falls Co.	Ireland, W. Springfield,	Mass.
Sidney Patch,	Boston,	"
Ames Manuf. Cor.,	Chickopee,	"
American Machine w'ks,	Springfield	"
Dean, Pickard & Mills	"	"
G. Frank Bradley,	N. Haven,	Conn.
Andrew Baird,	"	"
Collis & Lawrence	"	"
Slate & Brown,	Windsor Locks,	
Gage,	Nashua,	N. H.
Machine shop,	Manchester,	"
Louis F. Lanney,	Baltimore,	Md.
J. H. Baerdid,	179 Chambers st.	N. Y.
J. Fanning	Rochester,	"
G. W. Hunt	41 Gold st.	"
Chamberlain & Waldo,		"
P. S. Burges, carriage maker,		"
Samuel Miller,		"
J. Leggett,	Steverson falls,	"
J. E. Harris,	Hillsdale,	"
John L. Graham,	Albany,	"
David Dalsell,	South Egremont,	Mass.
Roys & Wilcock,	Berlin,	Conn.

Agents for the sale of Tuyeres:
B. B. Stevens in New York and Connecticut.
W. S. Seymour in Massachusetts and R. Island.

A. J. VanAllen has the Agency for the Western and Southern States, and is now travelling through those States. Any communication addressed to the patentee will receive prompt attention.

E. HARRIS, Patentee,
Springfield, Mass.

November 23, 1849.

CHRONOMETERS.

MERCHANTS, Ship Owners, Captains and others, are invited to examine the advantages offered in the purchase of Chronometers, by HEWITT & SON, Makers, 92 Wall Street, (up stairs,) in their superior quality and great reduction of price.

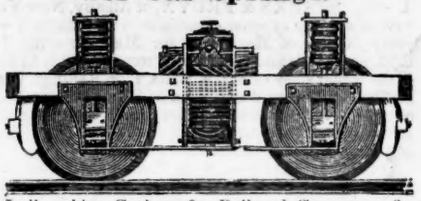
H. & S. have for many years been engaged in the manufacture of Chronometers, for the first houses in the trad and also, for the Navy of most Nations, and have received numerous rewards for their superior performance. Their Chronometers may be obtained from the Observatory at Liverpool, by order from H. & S., and at City Road, London. They are warranted to give satisfaction; but if not approved of, will be exchanged in New York, London, or Liverpool.

Rating, Cleaning and Repairs, at *low charges*.

The Trade supplyed on the most liberal terms.

November 17, 1849.

F. M. Ray's Patent India-rubber Car Springs.



India-rubber Springs for Railroad Cars were first introduced into use, about two years since, by the inventor. The New England Car Company, now possesses the exclusive right to use, and apply them for this purpose in the United States. It is the only concern that has tested their value by actual experiment, and in all arguments in favor of them, drawn from experience of their use, are in those cases where they have been furnished by this company. It has furnished every spring in use upon the Boston and Worcester road, and, in fact, it has furnished all the springs ever used in this country, with one or two exceptions, where they have been furnished in violation of the rights of this company; and those using them have been legally proceeded against for their use, *as will invariably be done in every case of such violation.*

The Spring formed by alternate layers of India-rubber discs and metal plates, which Mr. Fuller claims to be his invention, was invented by Mr. Ray in 1844.—In proof of which we give the deposition of Osgood Bradley, of the firm of Bradley & Rice, of Worcester, Mass., car manufacturers, and men of the highest respectability. In this deposition, in relation to the right of parties to use these springs, he says:

"I have known Mr. Ray since 1835. In the last of May or the commencement of June, 1844, he was at my establishment, making draft of car trucks. He staid there until about the first of July, and left and went to New York. Was gone some 8 or 10 days, and returned to Worcester. He then on his retnrn said he had a spring that would put iron and steel springs into the shade. Said he would show it to me in a day or two. He showed it to me some two or three days afterwards. It was a block of wood with a hole in it. In the hole he had three pieces of India-rubber, with iron washers between them, such as are used under the nuts of cars. Those were put on to a spindle running through them, which worked in the hole. The model now exhibited is similar to the one shown him by Ray. After the model had been put into a vice, witness said that he might as well make a spring of putty. Ray then said that he meant to use a different kind of rubber, and referred to the use of *Goodyear's Metallic Rubber*, and that a good spring would grow out of it." There are many other depositions to the same effect.

The history of the invention of these springs, together with these depositions, proving the priority of the invention of Mr. Ray, will be furnished to all interested at their office in New York.

This company is not confined to any particular form in the manufacture of their springs. They have applied them in various ways, and they warrant all they sell.

The above cut represents precisely the manner in which the springs were applied to the cars on the Boston and Worcester road, of which Mr. Hale, President of this road speaks, and to which Mr. Knevitt refers in his advertisement. Mr. Hale immediately corrected his mistake in the article quoted by Mr. Knevitt, as will be seen by the following from his paper of June 8, 1848. He says:

INDIA-RUBBER SPRINGS FOR RAILROAD CARS.—"In our paper yesterday, we called attention to what promises to be a very useful invention, consisting of the application of a manufacture of India-rubber to the construction of springs for railroad cars. Our object was to aid in making known to the public, what appeared to us the valuable properties of the invention, as they had been exhibited on trial, on one of the passenger cars of the Boston and Worcester railroad. As to the origin of the invention we had no particular knowledge, but we had been informed that it was the same which had been introduced in England, and which had been subsequently patented in this country; and, we were led to suppose that the manufacturers who have so successfully applied this material, in the case to which we referred had become possessed of the right to use that patent. It will be seen from the following communication, addressed to us by a member of the company, by which the Worcester railroad was supplied with the article upon which our remarks were based, that we were in an error, and that the springs here introduced are an American invention, as well as an American manufacture. How far the English invention may differ from it we have had no opportunity of judging."

AMERICAN RAILROAD JOURNAL.

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HENRY V. POOR, Editor.

ESTABLISHED 1831.

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ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*

GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*

M. BUTT HEWSON, C. E., *For Civil Engineering.*

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American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & CO., 136 NASSAU ST.

Saturday, January, 1850.

Lead Ores of the United States.

Though almost the only mines now wrought for lead are in the States bordering the Mississippi river, ores of this metal are of frequent occurrence in small quantity in all parts of the country, and they have in various places led to large expenditures of capital which has rarely been returned. It is a singular fact that there are more ancient traditions respecting *lead mines* current in every part of the country, than of any other mines; and there are few places where these traditions have not led to or encouraged idle search for productive veins. "The Indians," one is told, "used to dig lead ore in this neighborhood," and the same story is repeated with little variation in every town from Passamaquoddy bay to the mouth of the Mississippi; and this notwithstanding the Indians rarely knew its use or how to smelt the ore. It would be of great service to those credulous persons, who put confidence in such vague traditions, if they would impress upon their minds this great principle respecting the occurrence of workable veins of any of the ores, viz: that they seldom if ever occur isolated; but when a rich mine is known of any ore others are also found in its immediate neighborhood. Hence the chances are always extremely small in a country long inhabited, of discovering rich mines of metals, for which the region around has not before been famous.

Still the sulphuret of lead, like the sulphuret of iron, is an ore often found in small quantities both in the stratified and unstratified rocks, and I might cite and describe various localities in the New England and Middle States, where attempts have been made to work it; but I propose to select only a few of these, such as have given the greatest promise of success, and which, though now abandoned for mining purposes, may still at some future day call forth new enterprises.

The only ores worked in the United States are the sulphuret or galena and the carbonate of lead; the former is the common variety of lead ore, and is usually found associated with sulphuret of zinc or blende and carbonate of zinc or calamine and sulphuret of iron. Galena, when pure contains 86·55 per cent. of lead; the rest is sulphur, which driven off by a slow heat leaves the lead in a metallic state. The galena found in the primary rocks contains most frequently a small portion of native silver, and is then called argentiferous; the galena found in the limestones of the western States has no appreciable quantity of silver.

Of the New England mines that at *Shelburne*, N. Hampshire, has been the most promising; and in New York the *Rossie Lead Mine* in the unstratified rocks of St. Lawrence county; and the *Shawangunk Mine* in the stratified rocks of the Hudson river.

SHELBURNE LEAD MINE.

Though the existence of metallic ores has been long known in the region of the White mountains, little has yet been done to determine their importance. At an early period the iron mines of Franconia attracted more attention than they warranted, and the smelting of the magnetic ores from the small veins there found has since been followed with singular perseverance considering the utter unprofitableness of the operation. The want of success here may have discouraged the prosecution of other mining enterprises in this region; and so caused to be neglected the more promising resources, which it undoubtedly possessed. The geological survey of the State of New Hampshire, conducted by Dr. C. T. Jackson, has served to bring forward these resources to public notice, and to render it highly probable that the region will one day become an important mining district. The enormous *iron ore* beds of *Jackson & Bartlett*, the *tin ore* vein of the same vicinity, the *copper ores of Warren*, the *lead and zinc ores of Eaton*, of *Parsonsfield* in Maine, and of *Shelburne* encourage the hope that when these resources shall have been properly investigated, the region may prove in importance not unlike some of those older mining districts in Europe, which it now resembles in its external features and geological formations.

The *Shelburne Lead Mine* is situated in the hills a mile north of the valley of the Androscoggin four miles from the State line. Mt. Washington lies sixteen miles to the southwest, the principal summit of the White mountains. Mt. Lafayette and other high peaks grouped around constitute the great central mass of these mountains and of the granitic formations of N. Hampshire and Maine. The Androscoggin river winds its way among the high hills down to the sea, and its valley affords the most feasible route for the railroad now in progress from Montreal to Portland. This passes within two miles of the mine at the distance of seventy-five miles from Poriland, and if the mine should prove to be workable will be of no small consequence in the transportation of its products.

The vein is opened on the banks of a small tributary to the Androscoggin, called Lead river. On each side the hills of micaceous slates rise from 800 to 1000 feet in height, the strata lying north and south. Across these a great vein of quartz, from 10 to 25 feet in width, pursues its course in an east and west direction passing through the hills on each side; and in another ravine more than two miles to the west it is again met with, presenting the same characteristics of size and structure. This large vein consists for the most part of small quartz veins, all which pursue the same east and west course and dip together to the north at an angle of 71°. Interspersed with the quartz are seams of brown spar and calcareous spar, and on the north side near the upper wall small streaks of metallic ores are seen at the surface. These appear quite insignificant, not exceeding an inch or two in thickness. They consist of argentiferous galena principally; and associated with it are the sulphurits of zinc, copper and iron.

The highly argentiferous character of this ore having been disovered many years ago, attempts were made to work the mine, but the enterprise was soon abandoned. It remained neglected until June, 1846, when A. Colby, Esq., commenced reg-

ular mining operations, employing a force of ten hands. With these the work was vigorously prosecuted until the last summer, when it was suspended, probably to be renewed at a future day. Three shafts were sunk on the vein, and an adit level driven into the hill seventy feet in length. The main working shaft was carried down 268 feet, and a steam eugine was employed to raise the water, which at times was quite troublesome. The eastern shaft was sunk to the depth of 80 feet, and the wsstern 60 feet. Some short levels were run and the vein was stoped out in one place for about 30 feet in height. In all these workings the little seams of galena were traced without interruption, keeping near the north wall of the main vein.—They sometimes swelled out to a thickness of twenty inches of good ore, and then contracted again to their close dimensions at the surface. The richest spot was at the depth of 65 feet, nothing below was found to compare at all with the thickness of the lode at this point. The ore extracted from this nest was a mixture of fibrous with granular and crystalline galena associated with more or less copper and iron pyrites and black blende in the matrix of quartz crystals and brown spar. The "vugs" or cavities in the vein furnished some of the most beautiful groups of these crystals I have ever seen from any mines. The clusters of the different sulphurets are remarkable for the size and perfect form of the crystals, while they strike the eye by the variety of color and lustre, the brilliant jet black of the blende making a perfect contrast with the unsullied whiteness of the rock crystal in which it lies, and the silvery lustre of the galena vying with the golden hue of the copper pyrites by its side. Even the famed specimens from the Rossie mine are surpassed in beauty by those from Shelburne.

In the Report of the Geological Survey of New Hampshire Dr. Jackson describes this ore as yielding three ponnds of silver to the ton. Some analyses forwarded to me by A. A. Hayes, gave lbs. 3·2; lbs. 3·6; lbs. 6·477 and lbs. 7·53 of silver to the ton of argentiferous lead, which he extracted from large samples of several hundred pounds of the ore. From a portion of the washings which I took from the stamping mill at the mine in December, 1847, I extracted 73·75 per cent. of silver lead, which by cupelling, gave at the rate of lbs. 4·7 of silver to the ton of metal or lbs. 3·47 to the ton of ore. The value of this metal would be at $4 per 100 lbs. for the lead—$80; and for 3½ lbs. of silver at $20 per lb.—$70: making the total value per ton $150.—Contracts to extract the silver were offered at six dollars per ton of lead operated upon, the contractor to take the lead at the market price, and return the whole amount of silver.

The discovery of the large pods of ore in 1846, and the general favorable appearance of the lode, accompanied as it was with the seams of flucan and with every flattering indication of large quantities of galena, seemed to warrant the construction of a smelting furnace and machinery for stamping and cleaning the ores. These were bnilt on excellent water power close to the mine, the furnace being constructed after the Scotch plan of lead furnaces; and all built in the most thorough and workmanlike manner.

Though the proprietors have their subsequent ill-success to discourage them, as well as the uncertain character of this region for the production of other ores than those of iron, they are still aware that the work has not been prosecuted sufficiently far to be decisive; it would not be regarded so where the best veins of argentiferous galena are wrought in other countries. And as this vein is proved to be of enormous extent, and is traced over several miles of surface, the title to which is held by the same proprietors, it is certainly an object of great consequence to subject the matter to a thorough trial. The result, whether successful or not, will be a benefit to this section of the country, as it will tend to determine whether all the other veins of argentiferous galena scattered in various towns around are to be regarded as of any value or not.

At *Eaton* in the same vicinity is a large vein of sulphuret of zinc containing a vein of galena eight inches in width. The following account of this ore is taken from a report by A. A. Hayes, Esq., of April, 1846.

No. 1. A sample of 290 lbs. consisting of galena and blende with rock gangue. The whole was reduced to powder to furnish the sample. "The intimate mixture of the blende indicated that this ore was taken from the surface or part of the vein where, from natural causes, the galena had not assumed its distinct place."

The assay sample afforded 422 parts of silver lead in 1000, and some minute particles remained in the flux; another gave 430 parts. This is the extent that smelting on the large scale can give.

"Silver lead obtained from this ore is sensibly harder than soft lead, and exhibits a tendency to crystallize in large crystals. It is free from copper, iron and zinc, containing only silver (lead) and traces of sulphur.

The assays of the silver lead conducted on samples representing one ton of silver lead afforded an average return of 7·536 lbs. of pure silver."

No. 2. A sample of 300 lbs. treated as before afforded 446·5 parts in 1000 of silver lead; a second 463· parts. This lead aforded 6·477 lbs. of pure silver.

"Two points of prominent interest present themselves on considering the results of these assays.—One is, whether the reducing operations do or do not extract all the silver of the ore in combination with the lead rendered. This question experiment has affirmatively answered; no silver remains in the unreduced mixture of flux and zinc ores.

The other is, that in a mixture of the ores of lead and zinc, it is well known that smelting operations are never very perfect, and the lead is extracted with difficulty; will the lead resulting from imperfect operations still contain all the silver of the ore? It has been ascertained that all the silver will be retained by the lead, when even one half of the lead remains from the smelting operations; and as a matter of economy it may be advisable to extract only a large proportion of the lead from the ore, without incurring the greater expense of perfect operations, thereby insuring a richer silver lead at a less expense in the production."

The ore from Parsonsfield, Maine, in this same region, also contains a considerable portion of silver, but less than that of Shelburne.

A specimen of galena was put into my hands some time since from *Uxbridge*, Mass., which was stated to be highly argentiferous. I reduced it and then expelled the lead, and obtained from it at the extraordinary and I believe unequalled rate of 13·53 lbs. troy to the ton of *galena*. I am informed there are several small veins of the ore found in hard sandstone, adjoining limestone. A shaft has been sunk sixty feet into the limestone, but the veins were lost; the quantity where the vein showed the best was very small.

The least amount of silver in the ton of silver lead, which it is profitable to extract is by the lately discovered process of parting by crystallization as small as three ounces. Before this no lead was treated for silver, that did not contain about nine ounces per ton. The lead ores of Cornwall and Devonshire, England, are generally argentiferous, and have furnished silver for centuries past. Among the richest are the lodes of Bear Alston, which have produced large quantities of ore, often containing from 80 to 120 ounces of silver per ton of lead. The greatest quantity, which occurred in that part of them named the South Hooe mine, was 140·02 of silver per ton of lead. In 1784 and 1785 the silver produce of these mines amounted to 6,500 ounces. The ore of Garras near Truro produced in 1720 about 100 ounces of silver to the ton of lead. In 1814 the mine was re-opened and worked two years, producing in this time 800 tons of ore, containing 13 parts in 20 of lead, the lead yielding 70 ounces of silver per ton. Wheal Pool near Helston, about 1790 yielded from 40 to 50 ounces of silver per ton of lead—Wheal Rose 60 ounces of silver.*

In the next number I will describe the process of separating by crystallization, leaving the description of smelting the ores to accompany the account of the Wisconsin mines. H.

THE POISON OF THE VIPER.

The poison of the viper consists of a yellowish liquid secreted in a glandular structure, (situated immediately below the skin on either side of the head,) which is believed to represent the parotid gland of the higher animals. If a viper be made to bite something solid, so as to void its poison, the following are the appearances under the microscope:—At first nothing is seen but a parcel of salts nimbly floating in the liquor, but in a very short time, these saline particles shoot out into crystals of incredible tenuity and sharpness, with something like knots here and there, from which these crystals seem to proceed, so that the whole texture in a manner represents a spider's web, though infinitely finer and more minute. These spiculæ or darts, will remain unaltered on the glass for some months. Five or six grains of this viperine poison, mixed with half an ounce of human blood, received in a warm glass, produce no visible effects, either in color or consistence, nor do portions of this poisoned blood, mixed with acids or alkalies, exhibit any alterations. When placed on the tongue, the taste is sharp and acrid, as if the tongue had been struck with something scalding or burning; but this sensation goes off in two or three hours. There are only five cases on record of death followiug the bite of the viper; and it has been observed that the effects are most virulent when the poison has been received on the extremities, particularly the fingers and toes, at which parts the animal, when irritated, (as it were by an innate instinct,) always takes its aim.—*F. T. Buckland.*

EAST INDIA FINANCES.

The public are, we believe, aware that the Government of India is just now in the position of a good many of its faithful subjects—that is, its disbursements exceed its income, and it is obliged to cast about for the means (to use a popular phrase) of "making both ends meet." The depletion in the national treasury has not only been broadly disclosed by published accounts, but it has been indicated by certain characteristic symptoms, of which the principal is a tendency on the part of the authorities to cut down the emoluments of the lower grades of pnblic servants. Out of this state of things, a very important question has necessarily arisen—how is the existing deficiency to be remedied? Is the revenue susceptible of material enhancement, or will it be requisite to decrease the charges? Must the people be taxed to support the government, or are expenses of the State capable of such further reduction as to meet the deficiency complaiued of?

* See Geological Report of Cornwall, Devon and West Somerset by H. T. De La Beche, p. 611.

The East India Company's accounts for the last four years have been published by order of Parliament, and a contemporary, we observe, quotes from them the following "general balance:"—

	1844–45.	1845–46.	1846–47.	1847–48.
	£	£	£	£
Exp..	18,036,819	18,307,795	19,624,347	18,635,329
Inc...	17,293,305	17,112,419	18,653,145	17,619,391
Defic.	743,514	1,495,376	971,202	1,015,938

Taking the deficit of a million sterling annually as a real and tangible thing, and considering that by the annexation of the Punjaub, and the guarantee to the Railway Companies, it is likely to be, temporarily, very materially increased, the point for discussion is, how can government best arrange its finances, so as to surmount the great practical difficulty and annoyance presented by the deficiency in question?—*Irish Railway Gaz.*

Trade and Commerce of the Canals.

Up freights have ruled very steady. Contracts made early in the season paid the shipper much better than engagements entered into during the summer, and the fall contracts were about the same as those made in the spring. The general opinion of those engaged in this branch of business is, that but little money has been made by forwarding merchants, and that unlike 1847, the farmers alone have reaped the golden harvest, and all that is left to the forwarder for his toil and labor, is the satisfaction of having discharged his duty faithfully and honestly.

Notwithstanding business has been deranged by the existence of the cholera, the annexed figures show that the past season has but one equal in the history of our State canals; and that year can scarcely be taken as a criterion for others, we allude to the ever memorable 1847, when the foreign demand for all kinds of grain and breadstuffs were such as to call into requisition everything that would float, either on the lake, river or canal. Such a season as that was, can only be looked for once in twenty years, and should it occur more than once within that period, it would be unlooked for.

A reduction of tolls was made last winter by the Canal Board on corn and iron. This has doubtless tended to increase the shipments of these great articles of export, but notwithstanding this reduction, the tolls received this year are greater than that of any other season since 1847.

The number of boats navigating the canals this season, is estimated at about 4,500, some of them made only one trip, while others continued in motion during the season. Of this number, about 2,500 boats were run on individual account, and the remainder belong to, or were chartered by regular lines.—*Eve. Jour.*

STATEMENT showing the total quantity of each article which came to the Hudson River, on all the canals, during the years 1847, 1848, and 1849:

THE FOREST.	1847.	1848.	1849.
Fur and peltry, lbs.....	556,000	556,816	554,531
PRODUCT OF WOOD.			
Boards & scant.	299,078,633	262,279,116	297,431,140
Shingles, M...	101,527	104,270	51,258
Timber, c. ft...	1,613,943	1,510,777	1,497,627
Staves, lbs....	95,104,000	114,246,000	154,159,369
Wood, cords...	13,331	13,851	11,977
Ashes, bbls....	37,538	38,229	25,490
AGRICULTURE.			
PRODUCT OF ANIMALS.			
Pork, bbls.....	76,179	87,930	79,985
Beef, "	71,266	60,570	105,419
Bacon, lbs....	4,902,000	8,182,000	8,577,754
Cheese, "	40,844,000	43,280,000	42,097,818
Butter, "	22,724,000	23,730,000	20,880,409
Lard, "	4,348,000	9,926,000	9,083,062
Wool, "	12,044,000	8,534,000	12,731,402
Hides, "	172,000	176,000	596,364
VEGETABLE FOOD.			
Flour, bbls....	3,952,972	3,131,095	3,263,087
Wheat, bush..	4,143,830	9,116,134	2,734,389
Rye, " ..	295,119	286,919	322,942
Corn, " ..	6,053,845	2,933,964	5,121,270
Barley, " ..	1,523,020	1,548,197	1,400,194
Other grain bu.	2,040,052	2,077,724	2,407,895
Ship stuffs, "	2,093,681	1,437,487	2,022,031
Peas & beans"	106,088	75,808	160,234
Potatoes, "	108,369	115,629	242,211
Dried fruit, lbs	3,558,000	1,828,000	780,369
ALL OTHER AGRICULTURAL PRODUCTS.			
Cotton, lbs..	474,000	174,400	316,094
Tobacco, " ..	1,228,000	352,000	1,796,056
Grass seed " ..	3,308,000	1,666,000	2,479,098
Flax seed, " ..	4,128,000	1,764,000	1,381,684
Hops, " ..	1,948,000	1,598,000	1,877,805
MANUFACTURES.			
Domestic spirits, gals....	1,693,076	1,606,131	2,107,590
Leather, lbs...	5,168,000	4,540,000	5,532,610
Furniture, lbs.	1,972,000	1,548,000	1,116,300
Br & pg lead lbs	482,000	86,000	11,167
Blm & bar iron	26,348,000	11,528,000	27,906,016
Pig iron, lbs...	21,608,000	29,788,000	9,636,166
Iron ware, lbs..	3,014,000	2,314,000	1,737,690
Domes woolens	1,756,000	1,104,000	1,055,519
Domes. cottons,	2,396,090	2,468,010	2,498,425
Salt, bush.....	382,390	343,618	283,333
OTHER ARTICLES.			
Stone, lime, &c.	59,094,000	65,246,000	56,477,071
Gypsum, lbs...	8,513,000	3,718,000	2,551,600
Mine'l coal lbs.	32,580,000	48,292,000	25,169,939
Sundries.....	147,988,000	97,798,000	111,810,700

STATEMENT showing the aggregate, in tons, under the divisions specified in the above table:

	1847.	1848.	1849.
The Forest, tons	666,113	603,272	664,117
Agriculture, "	897,717	684,896	769,602
Manufactures"	51,532	44,867	44,236
Merchandise "	4,831	6,343	5,872
Other articles"	124,090	107,527	95,195
Total tons.....	1,744,283	1,447,905	1,580,072

STATEMENT showing the estimated value of each article which came to the Hudson River, on all the canals, during the years 1847, 1848, and 1849:

THE FOREST.			
Fur and peltry,	$590,150	$695,838	$692,864
PRODUCT OF WOOD.			
Board & scant.	5,078,564	3,931,277	4,459,158
Shingles, M...	406,548	388,861	153,774
Timber, c. feet,	169,160	212,598	119,608
Staves, lbs....	1,239,677	514,109	693,702
Wood, cords...	79,986	69,463	56,892
Ashes, bbls....	1,135,288	1,146,890	479,675
AGRICULTURE.			
PRODUCT OF ANIMALS.			
Pork, bbls.....	1,104,673	967,230	758,421
Beef, "	718,349	505,700	1,244,360
Bacon, lbs....	416,738	490,997	514,665
Cheese, "	2,860,354	3,029,169	2,736,212
Butter, "	3,408,751	3,359,391	2,923,831
Lard, "	434,780	761,757	635,814
Wool, "	3,599,963	2,304,044	4,072,358
Hides, "	21,611	19,494	59,636
VEGETABLE FOOD.			
Flour, bbls....	27,057,037	17,471,401	18,315,455
Wheat, bush..	5,833,901	3,677,020	2,993,161
Rye, " ..	259,940	200.310	187,545
Corn, " ..	5,179,970	1,834,388	2,970,482
Barley, " ..	1,279,337	1,037,293	868,115
Other grain, lbs	977,967	747,930	868,083
Bran and ship stuffs, lbs....	293,117	172,578	242,755
Peas and beans,	106,088	75,808	160,234
Potatoes, lbs...	51,755	53,109	117,919
Dried fruit "...	320,364	164,533	78,007
ALL OTHER AGRICULTURAL PRODUCTS.			
Cotton, lbs.....	35,498	11,356	29,239
Tobacco, lbs...	150,735	43,127	237,007
Clover & grass seed, lbs.....	231,518	116,692	148,746
Flaxseed, lbs..	103,219	35,268	30,536
Hops, lbs.....	188,179	159,695	262,893
MANUFACTURES.			
Domest. spirits	473,651	385,471	526,938
Leather, lbs...	963,201	680,842	885,030
Furniture, lbs..	197,254	153,536	111,630
Br and pg lead.	19,288	3,875	506
Bl'm & bar iron	660,896	172,931	558,120
Pig iron, lbs...	340,496	744,687	96,362
Iron ware, lbs.	123,808	80,993	52,131
Domes woolens	2,369,187	882,851	895,991
Domes. cottons,	740,901	622,652	698,816
Salt, bushels..	133,836	106,522	73,666
OTHER ARTICLES.			
Stone, lime and clay, lbs....	63,129	92,379	74,061
Gypsum, lbs..	17,584	8,336	5,742
Mineral coal..	81,453	108,559	56,633
Sundries, lbs..	2,944,911	2,001,252	2,241,539

STATEMENT showing the aggregate value of the property which came to the Hudson river, on all the canals, during the years 1847, 1848 and 1849, under the divisions as specified in the above table:—

The Forest....	8,798,373	5,909,015	8,044,646
Agriculture....	54,624,849	37,338,290	37,053,206
Manufactures.	6,024,518	3,834,360	3,899,237
Merchandise..	517,594	593,619	508,048
Other articles.	3,127,080	2,210,622	2,280,473
Total	$73,092,414	$50,883,907	$51,745,219

Vessels Built in the United States.

We take from the official report of the Register of the Treasury, a condensed statement of the vessels built during the year ending 30th June last, and the enrolled tonnage of the United States, with the number of foreign arrivals and departures during the same period:

Statement showing the Number and Class of Vessels built, and the Tonnage thereof, in each state and Territory of the United States for the year ending on the 30th June, 1849.

States.	Class of Vessels—Ships.	Brigs.	Schrs.	Sloops and canal boats	Steamers.	Total numb'r vessels built.	Total ton. Tons.	95ths
Maine....	119	107	105	6	7	344	82,256	56
New Hampshire....	8	..	4	..	..	12	6,265	89
Vermont..	..	..	..	..	..	..	..	..
Massachusetts....	33	7	65	9	1	115	23,888	84
Rhode Isl'd	3	3	4	3	..	13	2,760	28
Connectic't	2	1	38	14	1	56	5,066	29
New York.	17	8	64	155	21	265	44,104	26
New Jersey.....	..	1	57	27	2	87	8,025	55
Pennsylvania.....	3	2	27	102	63	197	24,207	73
Delaware.	1	..	17	5	..	23	1,880	34
Maryland.	9	9	129	..	5	152	17,462	93
Dist. of Columbia..	..	..	..	22	..	22	609	20
Virginia..	1	3	32	1	3	38	3,094	65
North Carolina ...	1	1	24	3	..	29	2,032	37
South Carolina ...	..	..	6	..	2	8	655	57
Georgia..	..	1	..	..	1	2	756	37
Florida...	..	..	1	..	..	1	119	88
Alabama..	..	..	2	1	..	3	106	54
Mississippi.....	..	..	..	..	..	..	..	..
Louisiana	..	1	12	4	4	21	1,755	48
Tennessee.	..	..	..	..	2	2	242	79
Kentucky.	..	..	..	..	34	34	8,423	33
Missouri..	..	..	..	8	11	19	2,886	54
Illinois....	1	3	9	..	..	13	2,270	34
Ohio.....	..	2	9	8	44	63	12,816	93
Michigan.	..	..	15	2	8	25	5,148	66
Texas	..	..	..	..	..	..	..	..
Oregon..	..	..	..	..	..	..	..	..
Total....	198	148	633	370	208	1,547	256,577	47

Statement of the Registered and Enrolled Tonnage of the United States, showing the Tonnage employed in the Whale Fishery; also the proportion of the Enrolled and Licensed Tonnage employed in the Coasting Trade, Cod Fishery, Mackerel Fishery, and Whale Fishery, from 1842 to 1849, inclusive:

Yr.	Registered Tonnage.	Enrolled and Licensed Tonnage.	Total Tonnage.	Registered Tonnage in Wh. Fish'y.
		TONS AND 95THS.		
'42.	986,368·74	1,117,031·90	2,092,300·69	151,612·74
'43.	1,009,305·01	1,149,297·92	2,152,601·93	152,374·86
'44.	1,068,764·91	1,211,330·71	2,250,095·07	168,293·63
'45.	1,095,172·44	1,321,820·57	2,417,002·06	190,695·55
'46.	1,131,256·40	1,431,795·32	2,562,084·51	186,980·16
'47.	1,281,312·92	1,397,732·80	2,839,045·77	193,853·70
'48.	1,360,846·84	1,793,165·00	3,154,041·85	192,479·92
'49.	1,488,941·53	1,875,013·71	3,334,015·20	180,185·20

PROFORTION OF THE ENROLLED AND LICENSED TONNAGE EMPLOYED IN THE

Yrs.	Coasting Trade.	Cod Fishery	Mackerel Fishery	Whale Fishery.
'42	1,045,753 39	54,804 02	16,096 83	377 31
'43	1,076,155 50	61,324 25	11,775 70	142 33
'44	1,109,614 44	85,224 77	16,170 66	320 14
'45	1,190,888 27	69,825 66	21,413 16	206 92
'46	1,259,870 89	72,516 17	36,463 16	430 58
'47	1,452,625 35	70,177 52	31,451 13	——
'48	1,620,988 16	82,651 82	43,558 78	482 75
'49	1,781,410 84	73,882 00	42,242 02	——

CONDENSED STATEMENT OF TONNAGE OF SOME OF THE PRINCIPAL PORTS OF THE UNITED STATES.

New York	378,962 89	417,504 85	796,491 79
Boston	247,336 14	49,553 85	296,890 04
New Bedford	115,091 12	8,826 45	123,911 57
Bath	61,938 38	26,822 40	88,820 84
Portland	56,657 01	29,911 79	84,588 80
Philadelphia	53,821 91	134,265 25	188,057 21
Baltimore	79,682 31	53,343 04	134,025 35
New Orleans	81,895 39	168,387 80	240,206 24
Charleston, S. C.	14,919 78	14,365 65	29,285 48
Wilmington, N. C.	10,873 94	5,767 88	16,641 87
Norfolk, Va	5,025 52	13,090 00	23,016 26
Mobile	7,080 48	17,982 31	25,067 79
Buffalo	.. ..	40,667 34	.. ..
Pittsburg	.. ..	35,770 63	.. ..
Detroit	.. ..	33,466 94	.. ..
St. Louis	.. ..	32,255 08	.. ..
Cleveland	.. ..	30,047 11	.. ..
Oswego	.. ..	22,151 63	.. ..
Chicago	.. ..	17,322 43	.. ..
Cincinnati	.. ..	16,897 74	.. ..
Sum total	1,438,941 54	1,895,073 71	3,334,015 29

Statement of the Number of Entrances of American and Foreign Vessels which entered into the several districts of the United States, from Foreign Countries, during the year ending June 30, 1849.

AMERICAN VESSELS.

No.	Tons.	Men.	Crews. Boys.
11,208	2,658,321	105,718	3,329

FOREIGN VESSELS.

9,992	1,710,515	87,033	2,651

TOTAL OF AMERICAN AND FOREIGN VESSELS.

20,200	4,368,724	192,751	5,989

Statement of the Number of Clearances of American and Foreign Vessels from ports in the United States during the same.

AMERICAN VESSELS.

No.	Tons.	Men.	Boys.
11,466	2,753,724	109,349	3,423

FOREIGN VESSELS.

8,849	1,675,709	89,579	7,704

TOTAL OF AMERICAN AND FOREIGN VESSELS.

20,313	4,429,133	198,928	6,125

BANGOR LUMBER MARKET, 1849.

Amount of lumber surveyed during the season 1849, 160,418,808 feet.

April	10,351,356
May	21,328,356
June	20,516,215
July	13,103,733
August	15,266,216
September	14,405,821
October	26,816,374
November	36,573,293
December	2,057,264
	160,418,808

Recapitulation.

Pine	74,176,591	Green lumber.
Spruce	23,619,349	
Hemlock, etc.	2,562,757	
	100,358,697	
	60,060,111	
	160,418,808	

60,060,111 feet of the above includes lumber piled out last season, likewise that piled out during the present season, together with lumber hauled from the interior. The amount piled out this season including that from adjacent towns hauled to market on teams will not probably exceed eight millions, leaving a balance of 62 millions piled out last season, (1848).—*Bangor Whig.* S. H.

Ohio Banks.

There are in this State three kinds of banks—1st, The Chartered, or "Old Banks," which were incorporated previous to 1846, and whose charters have not expired. 2d, The "Independent Banks," based upon a deposit of State stocks with the State treasurer, as security for their circulation, and each bank is also independent of all others. 3d, The "Branches of the State Bank," as they are called, although properly there is no State Bank *per se*, the *Branches* combined—united—forming what is termed the "State Bank." The whole number of banks in the State is fifty-six, and the number in each class as follows:

Old chartered banks	5
Independent banks	11
Branches of State bank	40

The condition of all the banks on the first Monday of November last, has been reported by the Auditor of State, and from his statement we select the following aggregates.

THE ELEVEN INDEPENDENT BANKS.

Specie	$330,811 70
Notes of other banks	231,859 19
Due from other banks	199,684 77
Eastern deposits	291,478 72
State bonds deposited with treasurer	1,176,006 90
Notes and bills discounted	1,931,635 42
Capital stock paid in	690,410 10
Circulation	1,106,701 00
Due to banks	158,384 17
Deposits	1,001,788 48

THE FORTY BRANCHES OF STATE BANK.

Specie	$2,516,386 01
Notes of other banks	570,258 51
Due from other banks	461,375 58
Eastern deposits	793,664 09
Safety fund deposited with board of control	824,157 10
Notes and bills discounted	10,163,878 13
Capital stock paid in	4,427,591 60
Circulation	7,988,913 00
Due to banks	289,650 00
Deposits	2,386,990 00

THE FIVE OLD BANKS.

Specie	$395,631 59
Notes of other banks	779,213 13
Due from other banks	181,846 71
Eastern deposits	387,913 52
Notes and bills discounted	3,498,626 31
Capital stock paid in	2,001,226 00
Circulation	1,348,961 00
Due to banks	845,474 00
Deposits	1,045,565 97

From the above it will be found that the immediate liabilities of the three classes of banks respectively, are to thetr immediate means as follows:

INDEPENDENT BANKS.

Immediate means	$2,229,832
Immediate liabilities	2,266,873

BRANCHES OF STATE BANK.

Immediate means	5,165,840
Immediate liabilities	10,665,553

OLD BANKS.

Immediate means	1,744,603
Immediate liabilities	3,239,980

In the above statement of "immediate means," capital stock, and bills and notes discounted are not included—regarding as *immediate means*, specie, bank notes, bank credits, eastern deposits, and State bonds deposited with the treasurer and the board of control; and as *immediate liabilities*, circulation, deposits and debts to banks.

From this official statement of the Auditor, the banks of no State in the Union are stronger or more impregnable.

CINCINNATI BANKS.

There are in this city six banks: Independent—the Commercial and City banks; Branches of State Bank—the Franklin and Mechanics' and Traders'. Old Banks—the Lafayette and Ohio Life & Trust. The following are some of the aggregates:

	Circulation.	Deposits.
Ohio Life and Trust	$6,375	$552,389
Lafayette	92,227	333,504
Franklin	253,390	286,821
Mechanics' and Traders'	156,373	119,331
Commercial	35,606	339,565
City	46,396	1,505
Total	590,367	1,633,115
	Specie.	Bank Notes.
Ohio Life aud Trust	11,729	600,322
Lafayette	72,755	99,128
Franklin	82,473	59,627
Mechanics' and Traders'	52,167	73,679
Commercial	21,457	44,166
City	9,454	5,481
Total	250,035	882,403
	Capital stock.	Discount.
Ohio Life and Trust	611,226	1,187,304
Lafayette	700,000	1,099,500
Franklin	169,000	536,199
Mechanics' and Traders'	100,000	292,176
Commercial	50,000	345,416
City	49,800	32,976
Total	1,679,026	3,493,571

In addition to the above, the Ohio Life and Trust has a capital of $2,000,000, which is loaned out on real estate, and the Commercial bank has 54,000 of safety fund stock, and the City bank has 50,000 dollars.

The entire circulation of the Cincinnati banks is 542,071 dollars less than the specie and bank notes on hand.

Michigan.

Central Railroad Company.—Below will be found a statement of the operations of the Michigan Central Railroad Co., for the fiscal year ending with the past month.

Length of road in operation		218½ miles.
Amount expended for construction, from Dec. 1, 1848, to Dec. 1, 1849.		$766,655 20
Indebtednesss of the company as near as can be ascertained, for materials or work in progress of delivery or execution, on account of construction, and not included in construction		$8,000 00
RECEIPTS.		
Receipts fm passengers	$321,114 50	
Do freight	264,820 68	
Other sources	15.051 42	$600,986 60
EXPENDITURES.		
For opening road, viz:		
Repairs of road	$65,310 76	
Do engines	39,832 27	
Do cars	17,051 23	
Other expenditures	173,285 52	$296,079 78
Number of through passengers		46,053½
Do way do		91,818
ROAD FURNITURE.		
Number of engines		28
Do passenger cars		28
Do baggage do		4
Do freight do, viz:		
Eight-wheeled or double	250	
Equal in single cars to	500	
Four-wheeled cars		71—571
Number of other cars		91
Average number of men		483
Number of miles run by passenger trains.		230,800
Do do do freight,	do..	149,315
Do do do other,	do..	98,531

The above comprehends all of the material facts relative to the business of the company.

As a matter of interest, we give the number of

passengers going east and west each month, and the receipts of the same;

Passengers East and West, and Receipts.

	Westward.	Receipts.	Eastward.	Receipts.
Dec. '48..	2988	$5,177 75	2621½	$4,329 56
Jan. '49..	2130	3,555 95	2079½	3,618 70
Feb. do..	1942	3,438 91	1931½	3,756 16
March do.	3101½	5,144 82	3236	5,484 77
April do..	4136	10,004 15	4045	9,837 41
May do..	8738	21,661 96	5750	10,263 86
June do..	8455½	16,726 03	6217½	14,512 56
July do...	7391½	12,268 49	5920	12,039 01
Aug. do..	6186	12,563 86	5156½	12,510 95
Sept do...	11879	27,094 33	8601½	21,176 06
Oct. do...	13042	36,994 88	8695	26,149 12
Nov. do..	8197½	21,254 59	5469½	15,293 11
	78,187	175,895 73	59,714½	145,001 27

Total number of passengers..... 137,901½
Total receipts for..... 321,114 50

COMPARATIVE STATEMENT.

We add comparative statements of some of the principal items for 1848 and 1849:

Total receipts from passengers, 1849.....		$321,114 50
Do. do. do., 1848.....		155,771 34
In favor of 1849.....		$165,343 26
Total receipts for freight 1849	$264,820 68	
Miscellaneous receipts.	15,051 42	$279,872 10
Total receipts freight, '48	208,819 37	
Miscellaneous receipts.	9,391 10	$218,210 47
In favor of 1848.....		$61,661 63

	1848.	1849.
Number of through passengers..	13,409	46,053½
Do way do ..	69,778¼	91,848
In favor of 1849.....	56,369¼	45,905¼

Total receipts freight and pass., 1849..	$600,986 60
Do do do 1848..	373,981 81
In favor of 1849.....	$227,004 79

	1849.	1848.
Road repairs.....	$65,910 76	38,721 06
Engine do	39,832 27	30,845 03
Car do	17,051 23	19,358 60
Other expenses.....	173,285 52	109,781 58

The last item includes locomotive service, station do., fuel, oil, stationery, new buildings, repairs to do., and incidental expenses of all kinds.

ROAD FURNITURE.

	1849.	1848.
In 1849, 250 eight-wheeled or double freight cars, and in 1848, 188 do., equal to single cars.....	500	376
Four-wheeled or single cars....	71	71
Gravel and other do	94	84
Passenger do	28	12
Baggage do	4	4
Engines.....	28	26
	1849.	1848.
Miles run by passenger trains.	200,860	101,893
Do frieght do...	149,315	113,069
Do other do...	98,541	116,811
Aver. number of men employed	483	308
Total construction account, 1848...	$1,911,078 43	
Do do do 1849...	766,655 20	

From the above figures, it will be seen that the business of the road has been rapidly increasing, notwithstanding the great check upon travel and business of all kinds, by the prevalence of the cholera during the past season.

The road continues under the able supervision of J. W. Brooks, Esq., whose industry and perseaerence eminently qualifies him for the responsible and laborious task.

PUBLIC HYGIENE.

Continued from page 804.

He afterwards goes on to say, that it is not the body alone which suffers by living amidst wretchedness and filth; the mind also becomes weakened. The quiet unresisting way in which the laboring class, habituated to dwell in such places, give way to the wretchedness of their lot, when attacked by disease, is a melancholy proof that they have lost the intelligence and spirit proper to the race of man. Their dullness and apathy indicate an equal degree of mental and physical paralysis. Physical wretchedness here does its worst on the human sufferer, for it destroys his mind. Again he says, the effluvium generated in close dirty districts, even when not bringing on positive disease, acts as a sedative in depressing both body and mind. It induces physical listlesness, rendering the people incapable of any great exertion, and this feeling of depression is one of their chief inducements to the use of stimulating liquids and opium, often arises from a sensation of lassitude and langour, the direct result of the debilitating causes that are incessantly acting upon them, and that renders them so incapable of physical and mental exertions."

To show how general is the ill effect of bad air upon the organs of the body, we may adduce the evidence of another medical gentleman, who had directed his attention to the structure of the ear, and the cause of the deafness. In deaf persons, the membrane of the middle ear, as it is called, becomes thicker. It is a semi-transparent membrane of extreme sensitiveness and delicacy. After a dissection of several hundred ears, the anatomist in question came to the conclusion, that this membrane was injuriously affected by contact with foul air, and that the deafness might in many instances be ascribed to this cause.

From what has been stated, we cannot any longer be surprised at the fact of the mortality of persons resident in towns, being so much greater than those living in the country; narrow confined alleys, air-tight courts, small, densely-crowded houses, celler dormitories,—these are places with which all towns abound, where fevers and other epidemics are always busy to a greater or less extent, and whence they spread, as from radiating centres, into healthier parts. It must be kept in mind, that the influence ot these seats of pestilence is by no means confined to those who reside within their immediate iimits. Disease extends itself to the whole town, poisoning the atmosphere which all classes breathe, and hence all are interested in effecting an abatement of the evils with which such places are afflicted. There is one part of Leeds so thickly inhabited that the people are packed together at the ratio of a 193,500 on the geographical mile; and there is a part of London where the population is at the ratio of 243,000 to a geographic square mile. But a part of Liverpool presents the maximum density of English cities. There the inhabitants are at the extraordinary rate of 657,936 to the same area, nearly 2¼ denser than the densest part of London. Whilst the annual mortality in the country districts of England is about 1 in 55, and that throughout England and Wales (town and country) is one in 46, the deaths in the metropolis are 1 in 37½, and in Liverpool, 1 in 28¼. In the country districts, out of every 1000 deaths, 202 are above 70; the average nnmber of septuagenarians, in 1000, throughout England and Wales, is 141, whilst in the towns it is only 90, in the metropolis it is 111, and in Liverpool 54. Out of every 1000 children born in London, 408 die under 5 years of age; in Liverpool 528; that is to say, 53 out of every 100. The average age of death at Kendal is about 36, at Bath 31, in four metropolitan unions 25, in Leeds 21, in Liverpool 17.

These figures show in a striking light the superior chance of life of persons living in situations where they can breathe good air. An Amerlean physician (Dr. Emerson of Philadelphia) bears important testimony upon this point. It is common, says he, to attribute the greater mortality known to take place under ordinary circumstances in large towns among the poorer classes, chiefly to meagre or unwholesome food, and immoderate indulgence in strong liquors. But in this country, where, for a part of the year, we are subjected to a degree of heat, little if at all below that of the tropics, the influence of both these causes in the production of disease is insignificant, when compared to that of breathing air that has been previously respired, and which, moreover, is commonly charged with animal and vegetable effluvia. That the same diet and habits of life in the country or small towns would not be attended with a degree of sickness or mortality corresponding to that found in the crowded portions of large towns, is, we think, beyond a doubt.

The complaints to which the inhabitants of towns are chiefly exposed, appear to be scrofula, fever and consumption; and it is quite worth our while to learn the way in which these disastrous complaints are generated, and the ravages they commit.

Scrofulous Affections abound to an enormous extent among the poorer classes—such is the testimony of medical men—and they are mainly attributable to the continued breathing of vitiated air.—Sore eyes, abscesses near the joints, ringworm and leprosy, are some of the various forms which scrofula assumes. Both on the continent and at home they are found to prevail in the most confined and worst ventilated districts. If a change has taken place in such a district by the pulling down and rebuilding on a better plan of the houses, it has been always found that a considerable improvement resulted in the sanatory condition of the people. Professor Alison of Edinburgh says, positively, that of the early great mortality in large towns, a very large proportion is caused by scrofulous disease; and the Queen's physician, Sir James Clark, says there can be no doubt that the habitual respiration of the air of ill-ventilated gloomy alleys in large towns, is a powerful means of augmenting the hereditary disposition to scrofula, and even of inducing the disease where there is no hereditary disposition.

Fever of every kind essentially depends on a vitiated state of the blood, arising from the introduction of some, usually animal, poison into the circulating current.

The exhalations arising from decomposing animal and vegetable matter, such as the contents of ashpits and cesspools, favor, in the highest degree, the extension of (if they do not of themselves generate, as many eminent medical men think) the disease of fever.

The mortality of all towns is very much increased by the vicious construction of the dwellings in respect to ventilation, and the supply of receptacles for refuse and excrementitious matter; the absence of drains, the deficient sewerage, and the overcrowding of the population, leading to gross neglect of personal cleanliness. These causes operate partly to induce the specific disease of fever, and partly to deteriorate the general health of the inhabitants, in such a way as to make them more liable to the attacks of nearly all diseases, but particularly of the specific disease alluded to, and also of those organs which first bear the brunt of the poison, i.e., the organs of respiration.

The period of existence during which fevers are prevalent is from 20 to 40, the period of maturity, and of this period the earliest part of it is much the most subject. It was found that the average number of patients in the London fever hospitals, 1825 to 1828, for four years, was 610 per annum; and of these, 390 were between the ages of 15 and 30, while the remaining 220 were made up of patients belonging to periods of life above and below this.

An experience of ten years preceding January, 1834, and derived from nearly 6,000 cases, gave data for calculating, that out of 100,000 patients attaked with fever,

Between the ages of	15	and	26	there would die 11,494
"	25	"	36	" 17,071
"	35	"	46	" 21,960
"	45	"	56	" 30,493
"	55	"	66	" 40,708
"	65	"	upwards	" 44,643

The risk of life thus appears to be twice as great at the age of 31 as it is at 11; nearly twice as great at 41 as it is at 21: and nearly five times as great at 61 as it is at 11. The rate of mortality in fever progressively and rapidly increases as life advances, yet the number of persons who actually perish by this disease at the adult age, and in the meridian of life, is far greater than at any other period of existence, on account ot the much greater number of persons who are attacked at those epochs.

It is a singular fact with regard to epidemics, that a certain type prevails for a number of years, and that this type sometimes gradually, at other times suddenly, disappears, and gives place to another, so different as to constitute a new disease, requiring new remedies, frequently the very opposite of those employed before. This new type in its turn gives place to a third, and so on for a long se-

ries of years. These changes, notwithstanding their apparent capriciousness, depend no doubt upon fixed and determinate causes, but those causes have not been ascertained.

Any deterioration in the physical condition of the body, not only renders it more liable to be attacked by this disease, but renders the disease more severe and fatal.

As to the insidious disease of consumption, the registrar-general puts down the appalling number of 60,000 as its victims every year in England and Wales. Of this number, Dr. Gray thinks that about 36,000 are cases of true pulmonary consumption, and he estimates the possible annual saving of adult life at 5000. In London, the deaths from consumption are 13½ per cent. of the total annual mortality, and 1 in 246 of the population. In Liverpool, it is nearly 18 per cent. of the deaths, and 1 in 156 of the population. The proportion of deaths of females from consumption is—for England and Wales, 1 in 431; for the metropolis 1 in 464; for Birmingham, 1 in 404; for Manchester, 1 in 392; and for Liverpool, 1 in 298. Dr. Gray attributes a large proportion of the deaths from consumption, among the laboring classes, to the deficient ventilation of the places where they work; and he gives many details, the result of personal examination, which show the poisonous condition of very many workshops in the metropolis. Next to defective ventilation in destroying human life is to be ranked the inhalation of dust, metallic particles, and irritating fumes. A fruitful source of disease is the abuse of spirituous liquors.

The most important part of our subject remains behind, and yet we have little space left for its discussion. What are the means of mitigating the evils arising from the inhalation of foul air? Prevention being better than cure, we must clearly do our utmost to remove the vitiating causes, and where that is impossible, we must obtain frequent supplies of air from a purer source. The first object will be attained by the employment of scavengers to remove from the surface the bulkiest refuse, and by the construction of drains and sewers on scientific principles, the thorough and systematic working of both being carried on and enforced under efficient superintendence. The drainage of towns is at present very defective. In some places the drains are open to the air, and allow pestiferous exhalations to rise into the atmosphere. Covered drains are frequently made with an insufficient fall, or of a shape that permits the heavier part of the floating refuse to settle and accumulate. Hence the current becomes clogged, is soon stopped, and the drain then becomes utterly useless, until the obstructions are removed. The sewers from the private houses into the main drains are very often in a defective state, and it is highly important that those who have the superintendence of drains should have the power to enter houses under proper regulations, in order to examine the sewers. A whole neighborhood may otherwise be contaminated by the obstinacy of one man. Secondly, ventilation must be employed to supply the interior of apartments with air in a fit state for respiration. This is a subject as yet confessedly but little understood, and very much neglected. A fine field is here opened for mechanical ingenuity, and a large am't of good might be conferred on the public bv practical men taking the subject into consideration. This much seems certain, that there ought to be an opening at or near the top of every room, in order to permit the escape of bad air. Being warmer and lighter than pure air, it ascends, and can only be dislodged by an expedient of this kind. Sir James Clark, in his work on the "Sanative Influence of Climate," speaks very highly of a contrivance invented by Dr. Arnott, for ventilating rooms by means of a valved opening in the chimney near the ceiling. The valve is so nicely adjusted and balanced that it admits a free current from the upper part of the room, the region of the most impure air into the chimney, and yet prevents all return of smoke. Much, says Sir James, as Dr. Arnott has done by his scientific inventions—the hydrostatic bed, the self-regulating stove, the ventilating air pump, etc.—the chimney ventilator, as a means of preserving health, may be regarded as the most important of the whole; and simple as it appears, it is unquestionably one of the most valuable gifts ever contributed by science to the preservation of health. The contrivance consists of a square iron tube, three to six inches in diameter, and so long that the outer orifice should be flush with the wall of the room, the inner one entering the chimney. These tubes are usually from four to six inches long. At the orifice next the room there is either a plate of perferorated zinc, or a piece of fine wire work, from the upper and back part of which hangs a piece of ordinary or oiled silk, which acts as a valve.

Mr. Toynbee, the senior surgeon to a large metropolitan dispensary, has introduced a method of ventilating apartments, which has answered very well. The ventilator consists of a plate of zinc very finely perforated with 220 holes to an inch, for the admission of external air through the windows. It varies from 4 to 12 inches square, according to the size and construction of the room. It is generally introduced into the uppermost portion of the window, and in the corner pane farthest from the fire place. The fine orifices prevent the air coming in with a rush, which would occasion discomfort, and they tend to diffuse the air equally and gently throughout the room.

The want of a direct and thorough perception of the fatal results of using vitiated air, has undoubtedly kept back many remedial improvements,which it is to be hoped are now dawning upon us. Our enemy is insidious—unseen in its deadly progress—hence it has unhappily escaped in a great measure the scrutiny of practicians, who find scope enough in working out plans for counteracting the effects of more tangible evils.

As we began, so we shall concludc onr article, by quoting the words of Dr. Arnott, whose scientific attainments, great exertions, and benevolent intentions give him a right of audience whenever the question of public hygiene is brought forward. "Suitable laws, and a fit administration of them, may go far to annihilate influences which now weaken constitutions, generate epidemics, and doom many of the laboring classes to hospitals, and workhouses, with the consequences to all around them of lowering the morality and the general tone of mind. Thus would a laboring population, among whom there is now much depression, suffering and disease, be changed into a more healthy, hardy and happy people, likely to prosper in their undertakings, and to exhibit civilization in improved forms."

Report of the Secretary of the Treasury.

We continue our extracts from the public documents for the purpose of laying before our readers such matters of interest as they may contain, and also for the purpose of preserving a record of them for future reference:

As every producer in one branch of useful industry is also a consumer of the products of others, and as his ability to consume depends upon the profits of his production, it follows that to give prosperity to one branch of industry there will be individual rivalry, but among the several branches of useful industry, there must always exist an unbroken harmony of interest.

No country can attain a due strength or prosperity that does not by its own labor carry its own productions as nearly as possible to the point necessary to fit them for ultimate consumption. To export its raw material and reimport the articies manufactured from it, or to neglect its own raw materials and import the articles manufactured from that of another country, is to pretermit the means which nature had provided for ifs advancement.

For, instance, we exported during the fiscal year ending 30th June, 1849, raw cotton to the amount of about sixty-six millions of dollars. If that cotton had been spun and woven at home, (supposing its value to be increased fourfold by manufacture,) it would have produced a value of about one hundred and ninety-eight millions in addition. What would have been the effect of this increased production on the prosperity of the country.?

This question would not be completely answered by merely pronouncing the added value of one hundred and ninety-eight millions of dollars, to be a large profit to the manufacturer, any more than the question of the effect of the production of wheat would be answered by deducting the cost of seed wheat from the value of the crop, and pronouncing the remainder to be a large profit to the farmer.

The manufacture of cotton cloth is begun with the planting of cotton—it is carried a certain point by the planter, and then taken up and perfected by the spinner and weaver. The planter and manufacturer are not engaged in different branches of industry, but in the same—the one commences the process which the other completes. Cotton seed of insignificant value being by regular stages of labor developed and brought to the form of cotton cloth, has acquired a value of about two hundred and sixty-four millions.

The planting states have added many millions to the annual productions of the country by the culture of cotton. By continuing the process they could quadruple that addition.

The planter then would have a market at his door for all his produce, and the farmer would in like manner have a home market for his. The power of consumption of not only breadstuffs. but of every artiele useful or necessary in the feeding, clothing, and housing of man, would be vastly increased—the consumer and producer would be brought nearer to each other, and in fact a stimulus would be applied to every branch of protective industry.

It is gratifying to know that the manufacture of cotton has already been introduced into several of the planting states, (see document marked, hereto annexed,) and it ought not to be doubted will rapidly be extended.

The manufacture of iron. wool, and other staples would lead to similar results. The effect would be a vast augmeutation of our wealth and power.

Upon commerce the effects might be expected to be, if possible, still more marked. It is not enough to say that no country ever diminished its commerce by increasing its productions, and that no injury would therefore result to that interest. There would probably be, not only a great increase in the amount, but an improvement not less important in the nature of our commerce.

Of the immense addition that would accrue to our internal and coasting trade, (which in every country form the great and most valuable body of commerce,) it is unnecessary to do more than merely speak in passing—but it may be well to offer a few remarks on foreign commerce.

Commerce is the machinery of exchange. It is the handmaid of agriculture and manufactures. It will not be affirmed that it is ever positively injurious—but it will be more or less useful as it cooperates more or less with the protective industry of the country. The mere carriage of commodities by sea or land is necessarily profitable only to the carrier, who is paid for it. It may be useful or not to others according to circumstances. The farmer finds a railroad a great convenience, but he understands that it is better employed in carrying his crop, than in carrying away his seed, wheat and manure.

The commerce which should consist in carrying cotton seed abroad, lo be there grown, would not be so useful as that which is now occupied in exporting the raw cotton grown at home. We should easily understand, also, that the commerce thus employed would be much more limited in amount, and much less profitable to the carriers than what we now have. Yet our present commerce is, in fact, of the same nature with that above described. The seed bears to the cotton the same relation which the cotton bears to the cloth. If we now export cotton of the value of about sixty-six millions, the same cotton when converted into cloth, would make an export of some two hundred and sixty-four millions, or some two hundred and forty-five millions, after deducting the fifteen or twenty millions, which would be required for our own consumption, in addition to the portion of our present manufactures consumed at home, and our imports would be hereby in like manner increased. England, at this moment, derives a large portion of her power from spinning and weaving our cotton.—When we shall spin and weave it ourselves, make our own iron, manufacture our own staples, we shall hrve transferred to this country the great centres of wealth, commerce, civilization, and political, as well as moral and intellectual power.

At present, we are far from having the amount of foreign commerce which is due to our position,

as a vastly productive country, with an extensive coast, good harbors, great internal water-courses, and a people unsurpassed in maritime skill and enterprise.

Our annual products were estimated by my predecessor in this department, at three thousand million dollars, while our average exports are about one hundred and thirteen millions, and our imports about one hundred and six millions, making together two hundred and nineteen millions, exclusive of gold and silver and of foreign commodities imported and re-exported. An eminent British authority estimates the annual creation of wealth in Great Britain and Ireland, at between two thousand one hundred, and two thousand millions. If we add, for articles omitted by him, between three and four hundred millions, we shall have a total of two thousand five hundred millions. The British exports and imports amount annually to about five hundred and twenty millions, exclusive of gold and silver, and of foreign commodities imported and re-exported. If their foreign trade brought down to our scale upon this estimate, it would be reduced to about one hundred and eighty-three millions. If ours were raised to their scale, it would reach about six hundred and twenty-four millions.

Estimating the population of Great Britain and Ireland at thirty millions, and our population at twenty one millions, their foreign trade averages $17,23 for each individual; ours $10,42. If their foreign trade were no greater than ours, in proportion to population, it would be reduced from five hundred and twenty to three hundred and twelve millions. If our foreign trade were as great in proportion to population as is theirs, it would be swelled to amount from two hundred and nineteen to three hundred and sixty-four millions.

A leading cause of the existing difference is to be found in the fact, that Great Britain exports chiefly what she has first brought to the form in which it is ready for ultimate consumption; it is at the stage of its highest value, and her market is almost co-extensive with the civilized world.

All history shows that where are the workshops of the world, there must be the marts of the world, and the heart of wealthy commerce, and power.—It is as vain to hope to make these marts by providing warehouses, as it would be to make a crop by building a barn.

Whether we can have workshops to work up, at least, our own materials, must depend upon the question, whether we have or can obtain sufficient advantages to justify the pursuit of this kind of industry.

The circumstances favorable to production in this country may be stated to be: 1st. Facility in procuring raw materials. 2d. Abundance of fuel—3d. Abundance of food and other articles necessary for the sustenance and housing of the laborer. 4th The superior efficiency of the laborers in comparison with those of other countries.

The circumstances supposed to be unfavorable to our production may be thus classed—

1st. Want of capital.

2d. Dearness of our labor as compared with that of other countries.

3d. Insecurity by exposure to the influence of violent and excessive fluctuations of price in foreign markets, and to undergoe foreign competition.

1st. Capital, which is but the accumulated savings of labor, is believed to be abundant among ourselves for any purpose to which it can be profitably applied. It is more divided than in some other countries, and associations of capital are therefore more common among us than elsewhere. It will be increased by the labor of every successive year, and for investments reasonably secure, it will flow in whenever required (as it has always heretofore done) from other countries, where it may exist in greater abundance. The amount of capital required for a large production is not enormous.—The whole capital, for instance, employed in the establishment and support of iron works in England and Wales in 1847, has been estimated at less than one hundred million dollars; the annual production then being about one million two hundred thousand tons.

2d. The difference between the price of labor here and in Great Britain is certainly great, and, it is to be hoped and expected, will never be diminished by a reduction of wages here. The difference has been estimated at an average of thirty-three per cent. Probably the average difference is much more than that. In some branches, such as the manufacture of iron, it is certainly much greater. This difference is in part compensated by the disadvantages under which the foreign manufacturer is placed, by the necessity, in some branches, of procuring his raw material from a great distance, or transporting a heavy article of production, such as iron, to a distant market. In addition, he is pressed by a heavy burden of taxation. The greatre efficiency of our labor is, to some extent, an additional compensatory element. This includes the greater capacity for acquiring skill, the superior general intelligence, the higher inventive faculty, the greater moral and physical energy, both of action and endurance, which our people possess, in comparison with the foreign laborer. Better fed, clothed, housec, educated—conscious of the ability to lay up some capital annually from his savings—encouraged to invest that capital in the enterprise in which his labor is engaged—enjoying practically greater civil and political liberty—looking forward to an indefinite future, in which, through his own good conduct and example, he may expect each successive generation of his descendants to be better circumstanced than its predecessor—it cannot be doubted that these advantages add greatly to the efficiency of the American laborer. The precise extent to which they go towards compensating the difference in the price of labor is difficult to define. The efficiency of our labor may be expected to increase with increase of reward to the laborer. In many of the New England factories, the laborers are encouraged to invest their surplus earnings in the stock of the company in which they are employed, and they are thus stimulated, by direct personal interest, to the greatest exertion. It may be expected that this system will be introduced into other branches, in which it may be found practicable, tending, as it does, so powerfully, to elevate the laborer, increase production, and practically instruct all men in the great truth of the essential harmony of capital and labor.

3d. Capital flows freely, at home and abroad, in every productive channel in which it can flow safely, and will even incur great hazards, if they be such as its owner may hope to meet by the care and circumspection of himself, or others to whom he has confinded its management. But if he knows that skill, industry and economy cannot avail him, and that, in addition to all the contingencies of rivalry and markets, he is to be further exposed to dangers arising from causes, quite beyond his control or counteraction, he will hold back. The vacillations which have occurred in our policy have no doubt deterred a large amount of capital from investment in industrial pursuits. The encouragement offered on one day, and on the faith of which fixed investments have been made, which are exposed to loss by the withdrawal of that encouragement on the next, is in in fact substantial discouragement. And the insecurity resulting from the repetition of such acts has been seriously detrimental.

4th. The fluctuations in the foreign markets, have for many years been such as seem to denote an unhealthy and feverish state of business. They are not in the natural course of a healthy trade.—They seem to betoken a change in existing arrangements, and the apprehension of such change is also evinced in the efforts now making in England to sustain the British manufacturer, by putting at hazard other imporiant branches of industry. The competition of new establishments with very large ones already in existence abroad, and in which the price of labor is lower, is evidently not an equal competition. The capital fixed in machinery, furnaces, &c. cannot be changed, and the work of production will not cease until the price shall have been reduced to a point very little above the cost of materials, labor and repairs. Of course, where the lower price is paid for labor, there will be a larger margin for reduction by the sacrifice of part of the profit; and where a great accumulation is in hand of the avails of the business of former years, the owner may find it his interest for a while to sell his commodity at less than the actual cost, if by that means he can drive out his rival, looking, of course, to subsequent reimbursement, at least, when he shall again have control of the market.

This known necessity of the position of the foreign manufacturers of course tends to discourage new, as well as to defeat the successful operation of existing investments of capital here, in similar enterprises.

To counteract the influence of these unfavorable circumstances, which, so long as they continue, must greatly retard our advancement, limit our foreign commerce, and prevent the due progress of industry, I propose that the duties on the staple commodities, [whether raw material or manufactured articles] in which foreign nations compete with our productions, be raised to a point at which they will afford substantial and sufficient encouragement to our domestic industry, provide for the necessary increase and due security of the revenue and ensure the permanence and stability of the system. Experience has, I think, shown this to be a wise, just and effectual mode to promote new and revive languishing branches of industry, provided the selection of the objects be wisely made, and limited to those productions for which the country is naturally adapted.

We have been perhaps too long hesitating and vacillating on the threshold of a great career.—The want of stability in the course of legislation, and other disturbing causes, have heretofore occasioned inconveniences. The short duration of some of the tariff acts—the great expansion of the currency which occurred during their operation—the compromise act, [a result of what was believed to be a political necessity] which, whatever is effects on existing establishments, undoubtedly discouraged new adventurers—and finally the unexpected repeal of the act of 1842—these circumstances have certainly been of a retarding character.

Yet it is impossible not to observe that, at every favorable moment, vast improvements in advance have been made, and that the ground thus gained has not been entirely lost. It is believed that every article, the manufacturer of which has been established here, has, after that establishment, continued gradually to diminish in price, and that, without a corresponding reduction in the wages of labor, which, indeed, could not be diminished by reason of an increased demand for it.

These facts lead irresistibly to the conclusion that our labor becomes so much more efficient by use, acquired skill, enlarged establishments, and new facilities derived from invention; that the difference in price between it and the foreign labor, however serious an obstacle to successful competition, will become less so with every year of our activity in the same branches of industry; and that it by no means follows that labor must be worse paid because its products are sold cheaper, or that because labor is better paid, its products must be sold dearer.

All that is wanting is a general determination that industry shall be encouraged and supported in the home production and manufacture of iron, wool, cotton, sugar and other staples, and that the legislation necessary to sustain it shall be firmly adopted and persevered in.

I will proceed to state the nature of the modifications which it appears expedient to make in the existing tariff, and, if required, will hereafter present a plan in detail.

1. The rates of duty are, in my opinion, too low, especially on articles similar to our own staples.—I conceive that the revenue has suffered materially from this circumstance. Indeed, I am compelled to believe that it would have been greatly diminished but for the extraordinary demand for our breadstuffs and provisions produced by the famine in Europe in 1847, and to a great extent continued by the short crop abroad in 1848. Even under these favorable circumstances, the average revenue from woolens, cottons, hempen goods, iron, sugar, hemp manufaetured, salt and coal, has fallen under the act of 1846, from $14,162,607 to 13,392,624 50, taking the average from the receipts of 1845-6, and those of 1848-9, being an average diminution of $769,982 50. Tne loss of annual revenue being as follows:

On cottons	$918,894 00
On hempen goods	61,794 50
On sugar	181,741 50
On salt	348,438 00
On coal	70,030 00
	$1,580,898 00

The gain as follows:

On woolens	$355,592 50
On iron	415,240 00
On hemp manufactured	40,083 00
	$810,915 50

The very small increase on the staples of woolens, iron, and unmanufactured hemp, compared with the vast injury occasioned to our production and the diminution thereby of our power of consumption, cannot fail to attract attention—while on the other articles named, the revenue and production have both suffered materially. It is believed that the revenue could be greatly increased by increasing the duties on these and other articles.

2. I propose a return to the system of specific duties on articles on which they can be conveniently laid. The effects of the present ad valorem system are twofold, viz: on the revenue and on our own productions. Experience has, I think, demonstrated, that looking exclusively to the revenue, a specific duty is more easily assessed, more favorable to commerce, more equal and less exposed to frauds, than any other system. Of course, such a duty is not laid without reference to the average cost of the commodity. This system obviates the difficulties and controversies which attend an appraisement of the foreign market value of each invoice, and it imposes an equal duty on equal quantities of the same commodity. Under the ad valorem system, goods of the same kind and quality, and between there cannot be a difference in value in the same market at any given time, nevertheless may often pay different amounts of duty. Thus the hazares of trade are unnecessarily increased.

AMERICAN RAILROAD JOURNAL.

Saturday, January 5, 1850.

The INDEX for the past volume will accompany our next number.

With our present number we commence a new volume, and a new year of our connection with the *American Railroad Journal*, and we can wish "a happy new year" to the great interests to which our paper is devoted, with a firm conviction that it will prove a far more prosperous one than the past. After a season of unexampled depressfon in all branches of business, in which no species of property has suffered so severely as railways, we have unmistakable evidence that we are on the return tide to a period of greater prosperity. The trials to which this kind of property has been subjected have been brought with it an experience which will teach us to avoid in future many of the errors which have been instrumental, to a certain extent, in producing the depression we have witnessed, and in bringing into discredit railway property. Confidence in railways, as the most effective means for the development of our vast resources, is undiminished, and with the new aid that increased experience is constantly furnishing us, we may expect a corresponding increase in the usefulness of these, the most potent agents that man has yet employed for his material and physical well being.

Notwithstanding the very general depression of the interests to which our paper is devoted, and our own inexperience in the new duties in which we have been engaged, we are happy in being able to state that our success has been far beyond our expectations. Our subscription list numbers more than twice as many names as it contained at the commencement of the past year. Our other patronage has increased in like proportion. We hope to be able to repay in some degree the favors which have been so freely extended to us, by a greater effort to promote the welfare of those great interests to which our paper is devoted, and upon which it rests for support.

[*Foreign Correspondence of the Railroad Journal.*]

ON BOARD THE EUROPA,
Nov. 17, 1849.

What a marvel is the steamship! The Europa, the last built and finest of the line of Royal Mail Steamers, is 275 feet long, 40 feet beam, and 1,800 tons burden. Her engines are 90 inch cylinder, 8 feet stroke, and 350 horse power each.

She consumes from 40 to 65 tons of coal per day, averaging 50 tons, and in consequence rises upon the water 2½ inches, or 2 feet 9 inches in the voyage. She can make ten miles the hour with a strong headwind, and has made the passage from Liverpool to Boston in 9½ days, the shortest on record.

We left Boston on the 7th, and have had quite a smooth sea, but a head wind most of the time; yet we are now ploughing up St. George's Channel, along the coast of Ireland, and shall, but for some untowered accident, be in Liverpool to-morrow morning at 7 o'clock, in which case we can if we choose take the cars to London, thence to Fokestown, or packet thence to Boulogne, and the cars thence to Paris, arriving at the latter place at 9 A. M., on the 19th, 11½ days from Boston. Thus are continents separated by a distance of more than 3000 miles made neighbors by means of a steamship!

As far back as 1807, Fulton put his first successful steamboat into operation, amid the scoffs and fears of the scientific as we,l as the ignorant. In 1812, the first steamboat succeeded in England.

These steamers for rivers and smooth waters, increased but slowly for many years. It was not till 1818, that the first was placed upon the western waters. In 1823, 15 were built in the United States. In 1826, 45. In 1832, 100. In 1846, 225. Within the last 15 years, this class of shipping has increased with wonderful rapidity, both in Great Britain and the United States.

The whole number belonging to the former may with safety set down at 1,500, and 2,000 to the United States. So that coastwise and internal steam navigation is now a well established and very important branch of commerce. Ocean steam navigation is of much more recent date, and may as yet be considered in its infancy.

The idea of connecting the Old World with the New, by packets sailing regularly on stated days, was not put into operation until 1820. In that year Messrs. Isaac Wright & Jeremiah Thompson, of New York, aided by Messrs. Crowther, Benson & Co., of Liverpool, established a line of 4 packets of about 450 tons each, between New York and Liverpool. They sailed from both places on the 10th of each month. Prior to this, vessels had always waited for their freight and passengers, and the experiment of having them sail on stated days, whether freighted or not, was regarded as almost sure to fail. Men of judnment, of business capacity, and not frightened at a project because new, were at the head of the enterprise, and carried it through so successfully that in less than five years, they doubled the number of their packets, and changed the times of sailing to the 1st and 16th of each month. In a few years, the number was still further increased, and a vessel left each port weekly. A variety of other lines of packets had also been established between important cities. Meantime, steamers had come into great favor, and had superceded sailing craft as regular and speedy carriers upon rivers and coastwise. The query was thus very naturally suggested, why they should not supersede the ocean packets. The scientific were appealed to for an answer to the question, and they demonstrated the absurdity of the proposition. The great majority of business men bowed in submission to the Savans, conspicuous among whom stoood Dr. Lardner. Fortunate for the world there are men in every age who insist that experiment is the most satisfactory way to settle such answers.

In 1838, the Syrius was sent out to solve the questicn, soon followed by the Great Western.—Both arrived safely in New York, and some time after this Dr. Lardner reasserted his position that ocean steam navigation was impracticable, and pointed to the trips of the Syrius and Great Western in proof.

Ten years have elapsed. For eight months steamers leave Boston or New York weekly for Liverpool, and the latter place for the former as often. In December, Jan'y, Feb'y and March they leave once in two weeks. The trips are made by some of the ships between New York and Liverpool on an average of less than 15 days, and in the 5 years not a single accident has occurred causing the death of a passenger in the Cunard line. The popularity of ocean steam navigation is established beyond a question.

Steam and Manufacturing Fuel.

The sources of an abundant supply of the best and cheapest fuel for steam and manufacturing purposes, continue to attract the attention which the importance of this snbject demands. From the numerous and almost daily increasing raitroad and steamship companies, and individual proprietors, this is a subject which necessarily challenges earnest and thorough investigation. Their increasing consumption of fuel, and the still greater demand arising from the magnificent ocean steam marine, now accumulating in our waters, together with the great diminution in the means of primitive supply furnished by the forest, admonish all of the urgent occasion for solving the problem, touching the cheapest and most reliable substitute for wood as a generator of steam.

Recent indications point to the semi-bituminous coals, as the variety in which most interest is felt, and to which most attention is being directed. The completion of that great national undertaking—the Chesapeake and Ohio canal—which connects the capital of the Union with the Allegheny mountains, and offers to the mining interest of the rich and inexhaustible Cumberland coal field, an unlimited means of transportation to tide water, at Alexandria, has contributed much to give this direction to the views of practical men. In the desire to contribute our contingent of labor, in the investigation that is now being instituted, we have colleeted from the very able and elaborate report made to Congress by Prof. Walter R. Johnson, the annexed comparison of the three principal coals that are classed as semi-bituminous.

	Total waste ashes and clinker from 100 lbs. of coal.	Weight per cubic foot.	Cubic feet per ton.	Earthy matter.	Pounds of coal evaporating 1 cubic foot of water.
Templeman's Cumberland	7·9622	54·29	41·26	10·36	6·5727
Dauphin and Susq.	16·363	50·54	44·32	21·49	7·499
Blossburg	11·2039	53·05	42·22	10·77	7·2069

Of the above varieties, the Cumberland coal alone has been tested to any satisfactory extent. Its constant use, for the two past years, on the Baltimore and Ohio railway—a work extending from Baltimore to Cumberland, a distance of 179 miles—attests its value. It is, we believe, the only in-

stance of a successful and protracted employment of coal, as a locomotive fuel, on a road of anything like the extent of the work referred to, which has yet been made in this country. This fact, we need hardly add, is entitled to great consideration—it being conclusive as to the adaptation of the Cumberland coal to locomotive use.

The able chief engineer of that road states that as the result of his experiments and tests, that one ton of this fuel is equal to two and one half cords of pine wood.

Much has of late been published on the subject of coals, and though we entertain no very alarming apprehension that the public will be *permanently* misled to ascribe virtues to any variety, to which it is not entitled, yet we cannot resist the temptation to transcribe, from the excellent work of Prof. Taylor, the subjoined paragraph.

"We continually meet with the unreserved and unqualified assertions of these claimants, that the coal of their particular mine or district, no matter where, is the best yet discovered for every practical use. Now, as they cannot all be the best, it follows that a good deal of exaggeration prevails in some of these cases. It is not inappropriate to state here, that there are probably a dozen or more of coal companies, in England, Wales and America, who announce through the press that their particular coal has been decided by the Agent of the Great Western Steamship Company or some other steamer company, to be the best generator of steam of all coals yet tried. One gentleman has also conclusively shown, that one ton of the bituminous coal of Cumberland, Va., is, in mechanical effect, equal to two tons of anthracite."

"However, the test of science restores all things to their true value, The examinations of Professor Johnson, in 1844, have dispelled many illusions—and have assigned to all the principal varieties of American coals their appropriate place in the catalogue: and here, the Cumberland coal takes the very highest place in the series, in the order of evaporative power."

Trade and Commerce of St. Louis.

Captain Embree has published in the St. Louis Daily Union, a statement of the quantities and value of eight staple articles in the Saint Louis market, the last two weeks of November, and the first two of December, for two seasons. In his recapitulation, the extent and comparison of the two periods are shown as follows:

1848.	
Tobacco, 307 hhds, 429,808 lbs	$13,490 00
Hemp, 1,025 bales, 205 tons	22,011 80
Lead, 33,559 pigs, 2,349,480 lbs	88,382 79
Wheat, 124,384 sacks. 1,421 barrels, 253,031 bushels	191,531 54
Flour, 53,251 brls	221,484 60
Corn, 41,475 sacks, 82,950 bushels	29,985 23
Oats, 8,746 sacks, 17,592 bushels	4,039 42
Whiskey, 2,535 brls., 101,400 gallons.	18,177 20
	$589,103 38

1849.	
Tobacco, 318 hhds., 435,200 lbs	$31,109 60
Hemp, 664 bales, 132 4-5ths tons	16,286 00
Lead, 62,818 pigs, 4,397,120 lbs	171,508 01
Wheat, 119.291 sacks, 1,068 barrels, 240,786 bushels	211,767 08
Flour, 51,829 brls	233,670 50
Corn, 7,909 sacks, 15,818 bushels	5,892.00
Oats, 10,053 sacks, 20,106 bushels	6,382 32
Whiskey, 2,596 brls., 103,840 gallons.	22,884 20
	699,499 11
Deduct	589,103 58
Difference in favor of 1849	$110,395 53

South Carolina.

Charlotte and South Carolina Railroad.

The second annual meeting of this company was held at Winnsboro on the 10th of October, 1849.

It appears by the report of the President of the Company, Edward G. Palmer, Esq., that the whole work of preparing the road bed is now under contract. Iron has also been purchased for 90 miles of the road, and the whole work is being vigorously pushed forward to its completion.

The whole amount expended upon the road up to October 1, 1849, has been,

For graduation, masonry and trestle work		$161,993 12
Superstructure		8,911 23
Catawba bridge		7,494 72
Engineering		23,855 27
Real estate		7,419 73
Land damages		4,122 88
Miscellaneous items		3,585 80
Total amount expended		217,382 75

The following table shows the estimated amount of expenditure for the year ending October 1, 1849.

Amount required to complete the graduation on first division	$28,022 15	
Amount required to complete the graduation on second division	59,035 04	
Third div. including Catawba bridge	114,899 46	
		201,956 65
To pay on contracts on fourth division		40,000 00
" on timber contracts	$36,237 98	
Laying superstructure	15,000 00	
1 Locomotive	6,825 00	
Freight and expenses on do.	250 00	
8 Platform cars	3,600 00	
Spikes	4,250 00	
Freight and expenses on do.	250 00	
Chairs	4,080 00	
		70,492 98
Expenditures required for which contracts have not been made:		
2 Locomotives	15,000 00	
2 Passenger cars and 2 baggage cars	7,000 00	
Depots, turnouts and water-stations	20,000 00	
Chairs and spikes for second division	6,000 00	
Timber & laying superstructure 2d division	15,080 00	
Engineering	11,400 00	
		74,480 00
		386,929 63
Of this amount, about will be paid in work on graduation contracts.		80,000 00
Leaving to be provided for		306,929 63

There remains yet of the capital stock of the company to be called in $657,000, independent of the State subscription; and to meet the present indebtedness of the company, amounting to $152,614 74, it is proposed to call for three instalments, one on the 1st of November, December and January; an instalment on the South Carolina stock amounts to $33,000, and on the stock of North Carolina to $9,000, amounting on the whole stock of the company to $42,000, which three instalments to be called for together with the arrears of instalments now due $42,000, constitute available means to the amount of $168,000. To meet the expenses of the company that shall accrue during the remainder of the year, four other instalments will be called for, at intervals of sixty days. The State of South Carolina has subscribed to this road to the amount of $260,000, payable in the bonds of the South Carolina railroad. This subscription to the amount of $200,000 has become available and has been of very great aid in furnishing means for the purchase of iron.

At Charlotte, this road will unite with the North Carolina Railroad, and in connection with it, will open a direct communication between the Central and Western portions of the latter State and Charleston. So that in addition to the business of the country it traverses, it will receive a large accession from the North Carolina road. A large amount of work on the road, has been done by the stockholders, in payment for stock, which has relieved the company from large cash payments, which would have seriously embarrassed its operations. Relative to this, we quote the following from the president's report:

"The practice of allowing stockholders to pay up their subscriptions in labor, is one of recent origin; is admirably calculated to increase the amount of stock subscribed, to facilitate its payment; and gives to the slave States great advantages over the free in the construction of railroads. As any one who has had the least experience on the subject cannot but be satisfied that slave labor is not only the most economical, but it is, also, the most efficient that can be applied to that purpose; and although this road was not, in the first instance, let in this manner, yet it has virtually resulted in it. The contractors, in many instances, hiring the hands of other stockholders, and purchasing their supplies of them, have contributed largely to the payment of stock in labor."

The affairs of the company appear to have been well managed, and the conduct of the directors received the unainmous approval of the stockholders.

The following is a list of the officers of the company:

Edward G. Palmer, President.

Directors—Dr. Charles J. Fox, A. Brevard Davidson, John A. Young, and William F. Phiper, of North Carolina; Joseph F. White, of York; Dr. John Douglass and James Pagan, of Chester; John Buchanan, of Fairfield; Benjamin F. Taylor, and James S. Boatwright, of Richland; Robert Martin, of Charleston.

John A. Bradley, Treasurer.

—— Garnett, Chief Engineer.

ARCHITECTS AND ENGINEERS IN FRANCE.—Much good results in practice, from the fact of the architect being made responsible for the durability of his works. We rarely hear in France of the fall of important buildings, in consequence of their ignorance, or the employment of bad materials. Public opinion is also far more severe in that country than with us when such instances occur. Navier, perhaps the first mathematician who practised as an engineer, is reported to have destroyed himself, because his suspension bridge of Les Invalides fell into the Seine. The engineer of the Central who executed the bridge over the Loire, which sank during the execution, and afterwards fell down during the floods of 1847, was obliged to retire into private life; while English engineers allow bridges and viaducts to tumble down, and no notice is taken of it. Indeed, as long as the decision as to who are the parties to be blamed in these cases, is left to the juries, composed of the first twelve persons who come to hand, such must ever be the case. We require some competent authorities to decide in these instances; and then our common sense would not be insulted by the fact of the fall of a viaduct being attributed to the washing out of the mortar in the arch-joints, or to an unequal loading of the arches by the spreading of ballast in an irregular manner. In the first place, hydraulic mortar should have been used; in the second, a viaduct which could not resist an extra quantity of ballast, is not fit for locomotive traffic. It is true that the constant sense of responsibility is likely to restrain the adoption of new principles, but it is certainly likely to prevent architects or engineers from running unjustifiable risks.—*Builder.*

New Orleans and Jackson Railroad Convention.

A convention, numerously attended, was held at Monticello, Mississippi, on the 10th ult., for the purpose of promoting the construction of a railroad between the above named places, and was organised by the appointment of William A. Stone, of Lawrence county, Miss., President; E. Ford, of Marion; H. G. Street, of Amite; Capt. W. A. Grice, of Madisonville, La.; and A. G. Wilbur, of New Orleans; as Vice Presidents; and John Marshall, of Hinds, and Samuel A. Matthews, of Pike county, as Secretaries.

The following counties in Mississippi were represented, viz: Hinds, Copiah, Amitie, Lawrence, Pike, Marion, as well as the Parishes of St. Tammany and Washington, La., and the city of New Orleans.

We learn that notwithstanding the extreme inclemency of the weather, the delegations from the above named counties in Mississippi were both numerous and highly respectable. Much spirit and enthusiasm prevailed during the sitting of the convention, and the resolutions, which were unanimously received, exhibit a degree of harmony very encouraging to the friends of this great enterprise.

We copy the following from the preamble and resolutions adopted by the convention:

Whereas, this convention, after a careful investigation of the subject, believe that the interests of the States of Mississippi and Louisiana, and the city of New Orleans, would be greatly promoted by a railroad from New Orleans to the city of Jackson, and that thereby the resources would be developed of a valuable portion of the country, now comparatively worthless for want of a convenieut outlet to market—that it would promote the convenience of the people living in the counties and parishes along the line of the road—increase the value of their estates, and add millions annually to the value of the country; and this convention believing further that it is highly practicable to construct a railroad, and that the public spirit and pecuniary ability of the country through which it will pass, as well as the terminus of the road, may be safely relied on to furnish the means both of money and labor for the construction of said road: therefore,

Resolved, 1. That the convention pledge itself to a strong, united and vigorous exertion on behalf of said road: to sink all minor differences of opinion, and all individual preferences in relation to the route of said road, when the same shall have been located, and yielding to "the greatest good of the greatest number," unite heart and hand in its completion.

2. That a committee of one from each county, parish and city, represented in this convention, be appointed and empowered to emply the services of competent engineers to examine the routes from Jackson to New Orleans, over which a railroad could be made to the best advantage, terminating either at Madisonville, or by way of the Rigoleta at New Orleans, or to the same terminus by the route originally projected for the New Orleans and Nashville road, and who shall report fully the probable cost of each route, and the description of the country over which it would pass, which reconnoisance shall be under the superintendence of at least three members of said committee, who shall report the same with all the facts and statements made by such engineer to an adjourned meeting of this convention, to be held at such time and place as may be hereafter designated.

3. That the committee charged with procuring the charters be instructed to ask the Legislatures of Mississippi and Louisiana to memoralize Congress for a grant of the public lands in the counties and parishes through which the road may run, to be appropriated towards its construction.

4. That when this convention adjourns, it shall be to meet again in the city of New Orleans, on Thursday, the 21st day of March next.

The chair, in pursuance with the above resolutions, appointed the following committees:

On Routes—John Marshall, of Hinds; E. Ford, of Marion; Wm. H. Bowen, of Lawrence; Archibald Steele, of Copiah; Franklin Love, of Amite; S. M. Catchings, of Pike; Capt. W. A. Grice, of Madisonville; J. M. Bell, of New Orleans; and N. S. Edwards of Washington Parish, La.

On Statistics—Wm. F. Robinson, of Amite; J. T. Lamkin, of Pike; Col. C. S. Tarpley of Hinds; Dr. George Nicholson, of Pike; Col. E. Safford of Marion; and J. B. DeBow, of New Orleans.

On Memorials—Samnel J. Peters, James Robb, J. W. Stanton, Alfred Hennen, John Leeds, James Saul, New Orleans; M. G. Penn, St. Tammany Parish, La.; Col. C. S. Tarpley W. Stone, Dr. J. T. Catchings, S. A. Matthews, P. S. Catchings, John J. Guion, John Wall, Mississippi.

On motion, the thanks of the committee were tendered the President and Secretaries, for the faithful manner in which they had discharged their duties.

The convention then adjourned to meet in New Orleans on Thursday, the 21st March, 1850.

An Account of the Construction of the Britannia and Conway Tubular Bridges.

The appearance of this work has been looked for with much interest, not only from the novelty and magnitude of the operation which it records, but also from the question which has been raised as to the degree of merit due to the several eminent scientific and practical men whose combined talent has produced so characteristic a monument of this iron age. With respect to the latter part of the question, whilst it will only be proper to reserve our judgment until the appearance of Mr. Clarke's work on the same subject, we are free to confess that Mr. Fairbairn's close and continued argument, which we could not satisfactorily abridge, seems to us satisfactorily to establish the justice of his claims. We proceed for the present to give such extracts as may best enable our readers to form a correct idea of the design and execution of the work:

"In the construction of the Chester and Holyhead Railway, two formidable obstacles had to be overcome. The deep and rapid tidal streams at the Conway and Menai Straits, had to be crossed by bridges, which must uecessarily be of extraordinary span and of great strength. No centerings or other substructures, such as are usually resorted to for putting such massive structures together, could be erected. Under such circumstances, the most obvious resource of the engineer was a suspension bridge, but the failure of more than one attempt had proved the impossibility of running railway trains over bridges of that class with safety. Some new expedient of engineering was, therefore, required, and an engineer bold and skillful enough to conceive such an expedient and to apply it. That engineer was found in Mr. R. Stephenson, and that expedient is the one, the history of which it is the object of the following pages to relate. Under Mr. Stephenson's direction, numerous other schemes had been devised. Both timber and cast-iron arches had been thought of; and a model of a very handsome bridge for crossing the Menai Straits on the latter principle, had been constructed, and it was, I believe, submitted to the consideration of a parliamentary committee. The possibility of erecting cast-iron arches over so great a span as 450 feet was, however, questionable, and the security of such a bridge could not but have been endangered by the great changes to which the material would have been subjected from atmospheric influences, and from the vibrations produced by the passage of heavy trains; but a more important objection even than these weighed in the withdrawal of this design. The Lords Commissioners of the Admiralty, as conservators of the navigation, opposed the erection of any structure which should offer a hindrance to the free passage of vessels under it, and insisted upon a clear headway of 105 feet from the level of high water. It was under these circumstances—having to encounter extraordinary difficulties of execution, and being compelled, by the opposition of so powerful a branch of the Government as the Admiralty Board, to abandon the ordinary resources of the engineer—that Mr. Stephenson conceived the original idea of a huge tubular bridge, to be constructed of riveted plates, and supported by chains, and of such dimensions as to allow of the passage of locomotive engines and railway trains through the interior of it. It was with reference to this expedient, after all others had been found inapplicable, that I was consulted by him, and that my opinion was requested—first, as to the practicability of the scheme; and, secondly, as to the means necessary for carrying it out. This consultation took place early in April, 1845; and, as far as could be gathered from Mr. Stephenson at the time, his idea then was, that the tube should be either of a circular or an egg-shaped sectional form; he was strongly impressed with the primary importance of the use of chains, placing his reliance in them as the principal support of the bridge, and he never for a moment entertained the idea of making the tube self-supporting. The wrought iron tube, according to his idea, was indeed entirely subservient to the chains, and intended to operate operate from its rigidity and weight as a stiffener, and to prevent, or at least to some extent counteract, the undulations due to the catenary principle of construction. In fact, for many months afterwards, and even up to the time of the experiments on the model tube in December, 1846, he insisted, as will be seen from the annexed correspondence, on the application of such chains. A perusal of this correspondence will, moreover, show that I was strongly opposed to their application, even as an auxiliary. I always felt that in a combination of two bodies, the one of a perfectly rigid, and the other of a flexible nature, is there a principle of weakness; for the vibrations to which the one would be subjected, would call into operation forces whose constant action upon the rivets and fastenings of the other could not but tend to loosen them, and thus, by a slow but sure agency, to break up the bridge. At the period of the consultation in April, 1845, there were no drawings illustrative of the original of the bridge, nor had any calculations been made as to the strength, form, or proportions of the tube. I was asked whether such a design was practicable, and whether I could accomplish it; and it was ultimately arranged that the subject should be investigated experimentally, to determine not only the value of Mr. Stephenson's original conception, but that of any other tubular form of bridge which might present itself in the prosecution of my researches. The matter was placed unreservedly in my hands; the entire conduct of the investigation was entrusted to me; and, as an experimenter, I was to be left free to exercise my own discretion in the investigation of whatever forms or conditions of the structure might appear to me best calculated to secure a safe passage across the Straits. This freedom of action was obviously necessary to the success of my experiments. I cannot but feel myself to have been honored by that confidence in my judgment which it implied. A period of five weeks was occupied in the construction of the experimental models, and in devising the means and preparing the necessary apparatus for the experiments. The whole series, detailed in the appendix, was conducted at my works, Millwall, Poplar; and the earlier experiments were witnessed by Mr. H. Ross and Mr. R. Murray, as assistants. Subsequently, when the large model tube was made, and the ultimate sectional form almost arrived at, Mr. E. Clarke, one of Mr. Stephenson's assistants, was also present, and for his employer's information, took copious notes of the proceedings. In consequence of the favorable opinion entertained by Mr. Stephenson of the cylindrical tubes, it was deemed expedient to commence experiments upon models of that kind, and to extend them subsequently to elliptical tubes. The whole of the results and observations made during the progress of the researches, as well as a description of the apparatus employed, I have carefully arranged and placed as an appendix, thinking that in that shape they would be more easy of reference to the scientific reader, who would thus be able to trace the gradual development of the principle of construction ultimately arrived at, from the experiments which led to it. On entering upon the correspondence, I may remark, that I have in general printed the letters entire; and, where selections have been made, the parts omitted usually referred to matters of a private nature. No doubt many communications are altogether missing, but I have

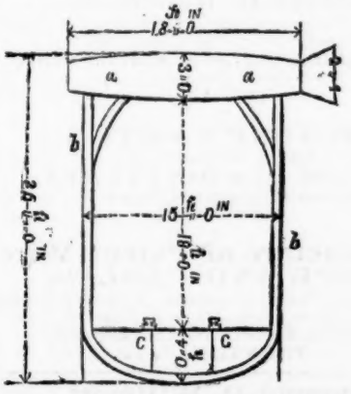
endeavored to connect the whole by such remarks as will render the narrative consecutive and clear. The following letter to Mr. Stephenson, was writ-during the experiments on the cylindrical tubes, and it details some early reflections with reference to a form of tube intended, in a manner, to meet Mr. Stephenson's views, but which suggested itself to my mind as superior to one supported by chains. He had conceived the idea, in which I then, to a certain extent, concurred, that the upper side of the tube should be brought into a state of tension as the lower, so that its strength, although a rigid structure, should not lie, as that of a beam does, in its resistance to tension on the one side, and to compression on the other, but wholly in a resistance to tension, as that of a flexible structure does. With this view, it was thought that something like the form of a catenary should be given to it, with a rigid bottom and sides.

—

"'Millwall Works, May 31, 1845.

"'My Dear Sir: It has occurred to me that the plate-bridge might be made considerably stronger by adopting a different form of construction, and by judicious arrangement, the whole might be made in one span of such an extent as 450 feet, so as to render it self-constructive in the formation of its own scaffold or platform. I have considered the subject with the utmost care since I left you, and, after repeated comparison, I am induced respectfully to submit the following rough sketch and description for consideration.

"'On contrasting the forces of extension and compression with each other, I find we must place our sole reliance upon the resisting forces of a tensile strain, and to use that of compression only for the purpose of giving tenacity and rigidity to the structure. With these views, I would suggest that the whole of the upper sides of the iron tube or tunnel should sustain the load, and for that purpose I would incline to the annexed section (see fig. 1.) The parts *a a*, to be each 18 feet wide, 3 feet deep in the middle, and 2 feet 4 inches at each end, and composed of plates say half an inch thick, with angle iron frames, and connecting plates at every 10 feet. The sides, *b b*, to be composed of 5-16 (or quarter-inch patent) plates, with internal T iron frames, radiating from the upper curvatura of the suspending plates. The bottom to be formed as before, with a permanent platform and rails, as represented in the sections at *c c*. The sides, *b b*, in this case, descending a little below the curves, for the purpose of rendering the whole somewhat



symmetrical. Now, if we examine into the properties of this construction, it will be found that the material so distributed will sustain in the upper section (at only 20 tons to the square inch) a tensile strain of 4,600 tons; and, provided we deduct one-third for riveted cross-joints, we still have upwards of 3000 tons for the strength of suspension, independent of the sides and bottom, which, if made of thick-edged plates, would give the power of resistance above 4,000 tons. In this hasty sketch, I have not gone into the question of weights; but, at a rough calculation, I should suppose one tube, of say 500 feet, would weigh about 500 tons, equal to a total of say 3000 tons, in two lines of 1500 feet each. These views will not interfere with the experiments now in progress, but I should be glad of your opinion, in order to guide me in the future development of principles which, at present, are but imperfectly understood. I am, &c.

"'R. Stephenson, C. E. W. Fairbairn.'

—

From the very commencement of the inquiry, the means which should be employed in erecting and raising such a large structure over a broad and rapid stream, was a subject of deep reflection; and the point seemed, indeed, surrounded with impediments not easily overcome. It was probably not essential to discuss such a question before the practicability of the scheme was ascertained, and the form and dimensions of the tube itself determined on; but it nevertheless weighed upon the mind, and as will be seen by the letters, numerous expedients were originated and discussed before the means actually adopted were matured. My first thoughts were expressed in these terms to Mr. Stephenson:

"'Manchester, June 3, 1845.

"'My Dear Sir: My mind has been fully engrossed with the subject of the Menai Bridge. Whatever may be the principle upon which it is to be constructed, there will be no difficulty in its erection, nor will there be any considerable expense incurred. If, for example, the piers were erected, and the whole of the tubes riveted together in sections, we could first commence the erection by fixing the centre parts upon the saddles of the piers; this being accomplished, we should then proceed in each direction, fixing the sectional parts, and maintaining the weights and balance equally on both sides, till they meet in the middle.

"'On this plan, the parts would always be in equilibrium on the middle of each of the piers, and by means of two moveable cranes and a working scaffold, as will be easily seen, we could work progressive forward with 10 ft. sections till they meet, when the two could be united in the usual way with rivets. By these means, I think every difficulty with regard to erection would vanish; and, provided the parts were well put together in the first instance, we might carry such a structure across any straits or ravine of even greater extent than the Menai Straits. I shall be glad to hear your opinion in addition to my former letter upon this and other matters, and remain, &c.

"'W. Fairbairn.

"'R. Stephenson, Esq., C. E.'"

"The above letter proposes a self-constructing system of erection, to avoid, if possible, the dangers and difficulties attending the moving and raising of such an enormous weight to a height of 100 ft., or 120 ft., and then fixing it with safety upon the piers. On mature consideration, it appeared next to impossible to maintain the balance of so great a mass upon the pier as a fulcrum, and so to keep both ends in an exact line (as regards their horizontal and lateral position) as to cause them to meet in the middle. The plan was, therefore, abandoned for another of a more tangible kind. Previous to the date of the following letter, July 19, considerable progress had been made with the experiments on the cylindrical tubes, all of which were found more or less defective. Great difficulty was experienced in keeping them in shape; and the experiments, whilst they gave ground for confidence as to the ultimate result, showed pretty clearly that it was not to be attained under this form of tube. These facts are intimated to Mr. Stephenson as follows:

—

"'Manchester, July 19, 1845.

"'My Dear Sir: The last course of experiments was not only satisfactory, but such as to induce a considerable alteration in form, as well as a much more extensive investigation. These researches require the utmost care; and new developments, as well as correct results, are only obtained by repeated trials of an experimental and inductive character. It shall be my special province to ascertain the facts, and determine the law which governs the strength and form of this important structure.

* * * Previous to leaving town, I gave orders for an increased number of tubular models, to be made of different forms and dimensions. Towards the end of the ensuing week, they will be completed, and I purpose again commencing the experiments on Wednesday morning, the 30th instant, when I hope you will be enabled, along with your father, to attend. I am, &c., W. Fairbairn.

"'R. Stephenson, Esq.

July 21, 1845.

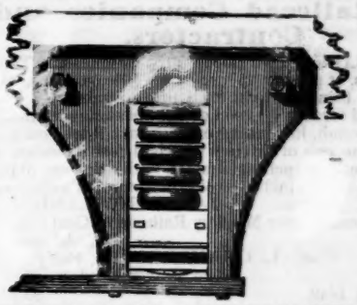
My Dear Sir: * * I am glad to hear that you are proceeding with other forms of tubes; I hope some of them of an elliptical form, and with thick plates at the top and bottom, will be tried, for in this way the disposal of the material will approach nearly to that of a common T girder, which is doubtless the thing to be aimed at.

"'Yours, &c., R. Stephenson,

"'W. Fairbairn, Esq., Millwall, or Manchester.'"

To be continued.

FULLER'S PATENT INDIA RUBBER SPRING.



THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them.

Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability.—Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

—

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours." JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

—

"I do not hesitate to allow you to say that I concur in Mr. M'Rae's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M'Rae had seen your springs (as I believe) and entertain it still." WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

—

Office of Sup't Norwich & Worcester R.R Co.
December 26, 1849.

"I most fully concur in the opinion of Jno. McRae, Engineer of S. Carolina Railroad, that 'Rays Springs are inferior to Fuller's Springs;' and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."
SAM'L H. P. LEE, JR.,
Sup't and Engineer.

—

Office B. & P. R. R. Co.,
Boston, 20th December, 1849.

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and I do not hesitate to say that Fuller's arrangement is *very much superior* to Ray's.
W. RAYMOND LEE, Supt.

—

The following result has been obtained by experiment upon one railroad.

A set of Trucks fitted with Steel Springs cost	$190·77	and weigh	2355 lbs.
The same with Fuller's Springs, ...	131·71	"	1911 lbs.
Difference, . .	$59·06	"	444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.
G. M. KNEVITT, 38 Broadway, N. Y.,
General Agent for the U. S.

The Springs can also be had of
JAMES LEE & CO., 18 India Wharf, Boston, &
JAS. THORNLEY, 110 Chestnut St., Philad.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns' for sale by

COLEMAN, KELTON & CAMBELL,
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Cop Waste.

CLEAN COP WASTE, suitable for cleaning Railroad, Steam boat and Stationary Engines, constantly an hand and for sale by

KENNEDY & GELSTON,
5½ Pine St., New York.

October 27, 1849, 3m

To Railroad Companies and Contractors.

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address JAMES ROWLAND,
Prest. Beaver Meadow Railroad & Coal Co.,
Philadelphia.
or, L. CHAMBERLAIN, Sec'y,
at Beaver Meadow, Pa.

May 19, 1849. 20tf

The New York Iron Bridge Co.

LATELY KNOWN AS
Rider's Patent Iron Bridge Co.

THE Company which has hitherto furnished these Bridges, under the patent granted to the late Nathaniel Rider, deceased, have become satisfied that all the principles embraced in their construction, are included in a previous patent, granted in the year 1839, to Col. Stephen H. Long, of U. S. Engineers, and by him designated as "Long's Suspension Bridges," and have therefore made an arrangement with Col. Long, by which they have secured the exclusive right to make and vend these Bridges throughout the whole United States.

The only change consequent upon the new arrangement will be found in the name and style of the Company. The parties composing it being the same, the construction of the Bridges will be essentially the same.

August 4th, 1849. M. M. White, Agent,
au7tf No. 74 Broadway, New York.

Wanted,

A Second Hand Locomotive, weighing from 10 to 12 tons. It is required that in answer, it will be stated, whether the engine has inside or outside connections—the price of the same delivered at Portland, Maine, and terms of payment expected. Address

VIRGIL D. PANIS,
President Buckfield Branch Railroad,
Portland, Maine.

November 10, 1849. 3t45

To Contractors.

BLUE RIDGE TUNNEL.—The Contractor for the BLUE RIDGE TUNNEL, having failed to come forward and comply with his engagements, notice is hereby given that PROPOSALS will again be received at the Office of the Board of Public Works, until the 21st of January, 1850, for the construction of the Tunnel and approaches.

The Tunnel will be 4260 feet long, 21 feet high and 16 feet wide, with a ditch on each side; it will pass 700 feet under the top of the Mountain and decline from West to East at the rate of 70 feet to the mile. The approaches will be in the aggregate about 2000 feet long, and consist of deep cuts, high embankments, some walling and bridging.

Proposers who have not already examined the localities will do well to call at the office of the Engineer, on the spot, where they will obtain all necessary information.

The payments will be CASH, with a reservation of 20 per cent till the entire completion of the work; besides which, the contractor is required by law to give bond, with satisfactory bond and security in Virginia. The amount of the bond required will be thirty thousand dollars.

The best testimonials and an energetic prosecution of the work are expected: the contract and bond to be executed within *ten days* after the letting, and the work to begin *bona fide* within sixty days after the same period.

C. CROZET.
Engineer Blue Ridge Railroad.

Terms of proposals and specifications may be obtained at both offices.

NOTICE TO Superintendents of Railroads.

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject. P. B. TYLER.

(COPY.)

UNITED STATES PATENT OFFICE,
Washington City, D.C., April 28th, 1846.

SIR: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully, EDMUND BURKE,
Commissioner of Patents.

To Philos B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York.

34tf

ENGINEERS.

Arrowsmith, A. T.,
Buckfield Branch Railroad, Buckfield, Me.

Bancks, C. W.,
Civil Engineer, Vicksburg, Miss.

Berrien, John M.,
Michigan Central Railroad, Marshall, Mich.

Buckland, George,
Troy and Greenbush Railroad.

Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W, H.,
Engineer and Surveyor, St. Louis, Mo.

Davidson, M. O.,
Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,
Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,
Binghamton, New York.

Holcomb, F. P.
Southwestern Railroad, Macon, Ga.

Higgins, B.
Mansfield and Sandusky Railroad, Sandusky City, O.

Johnson, Edwin F.
New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,
Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,
Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,
Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,
Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,
South Carolina Railroad, Charleston, S. C.

Nott, Samuel,
Lawrence and Manchester Railroad, Boston,

Reynolds, L. O.,
Central Railroad, Savannah, Ga.

Roebling, John A.,
Trenton, N. J.

Roberts, Solomon W.,
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Robinson, James P.,
Androscggin & Kennebec Railroad, Waterville, Me.

Schlatter, Charles L.,
Northern Railroad (Ogdensburg), Malone, N. Y.

Stark, George.,
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,
Pottstown, Pa.

Trimble, Isaac R.,
Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,
United States Fort, Bucksport, Me.

Thomson, J. Edgar.,
Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,
Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,
Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,
Milwaukie, Wisconsin.

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George O. Robertson,
Broker in Scotch and American Pig Iron; Bar Iron, Lead, Spelter, Tin, Copper, etc.,
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(Near Broadway,)
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On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
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Manufacture of Patent Wire ROPE AND CABLES,
For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tillers, &c., by
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PLUSHES, CURTAIN MATERIALS, ETC.,
112 WILLIAM ST., NEAR JOHN.

3-4 and 6-4 Damasks, Union and Worsted; Moreens, Rattinetts, Cloths, Silk and Cotton Velvets, English Buntings

Walter R. Johnson,

CIVIL AND MINING ENGINEER AND Attorney for Patents. Office and Laboratory, F St., opposite the Patent office, Washington, D. C.

S. W. Hill,

Mining Engineer and Surveyor, Eagle River, Lake Superior.

Starks & Pruyn,

MANUFACTURERS OF ALL KINDS OF

STEAM BOILERS,

52 and 54 Liberty, corner of Pruyn street

Nathan Starks, ALBANY Special Partner
Wm. F. Pruyn, R. H. Pruyn.

Iron Railing, Bank and Vault Doors, Iron Shutters Bridge and Roof Bolts, Heavy Jobbing and Forging of all kinds.

☞ For particularss ee Adv. in another column.

To Engineers and Surveyors.

E. BROWN AND SON Mathematical inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

Samuel Kimber & Co., COMMISSION MERCHANTS

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

James Herron, *Civil Engineer*,

OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.

—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address E. S. NORRIS.

May 16, 1849.

Machinery Warehouse.

S. C. HILLS, No. 43 Fulton street, New York, has constantly for sale Steam Engines, Boilers, Lathes, Chucks, Drills, Planers, Force and Suction Pumps; Tenoning, Morticing and Boring Machines, Shingle Machines, Bolt and Nut Machines, Belting, Oil, Iron and Lead Pipe; Rubber, Percha and Leather Hose, &c., &c.

S. C. H.'s arrangements with several machine shops are such that he can supply, at very short notice, large quantities of machinery.

November 23, 1849.

Cruse & Burke,

Civil Engineers, Architects and Surveyors,
Office, New York State Institution of Civil Engineers,
STATE HALL, ALBANY., N. Y.

Drawings, specifications and surveys accurately executed. Pupils instructed theoretically and practically at a moderate premium.

May 26, 1849.

Eaton, Gilbert & Co.,

Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Hudson River Foundry, THOMAS & COLLINS,

130 Quay Street, Albany.

To Railroad & Navigation Cos.

MR. M. BUTT HEWSON, *Civil Engineer*, offers his services to Companies about to carry out the surveys or works of a line of Navigation or Railroad. He can give satisfactory references in New York City as to his professional qualifications; and will therefore merely refer here to the fact of his having been engaged for upwards of two years conducting important Public Works for the British Government.

Communications will find Mr. Hewson at the office of the Railroad Journal, 54 Wall Street, New York.

Alfred W. Craven,

Chief Engineer Croton Aqueduct, New York.

Manning & Lee,

GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works. Maryland Mining Company's Cumberland Coal 'CED —'Potomac' and other good brands of Pig Iron.

IRON.

IRONDALE PIG METAL, MANUFACTURED and for sale by the Bloomsburg Railroad Iron Co.
DUDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

500 Tons, afloat, weighing 57 pounds per lineal yard, for sale by
COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849. 1m46

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,
158 South St.

New York, November 17, 1849.

Railroad Iron.

1600 Tons, weighing 60½ lbs. per yard.
185 " " 57½ "
580 " " 53 "

of the latest and most approved patterns. For sale by
BOORMAN, JOHNSTON & CO.,
119 Greenwich street.

New York, Oct. 13, 1849.

Railroad Iron.

THE Undersigned have on hand, ready for immediate delivery, various patterns of Iron Rails, of best English make, aud manufactured in conformity with special specifications.

They offer also to import and contract to deliver ahead—on favorable terms.

DAVIS, BROOKS, & CO.,
68 Broad street.

New York, Oct. 11, 1849.

☞ Drawings and Patterns of the most approved Rail—and specifications of quality and make of same, are on hand at their office, for examination of parties who may desire to inspect the same. D., B. & Co.

Oct. 11, 1849.

CUT NAILS OF BEST QUALITY, BAR IRON (including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Railroad Iron.

THE Undersigned offer for sale 3000 Tons Railroad Iron at a fixed price, to be made of any required ordinary section, and of approved stamp.

They are generally prepared to contract for the delivery of Railroad Iron, Pig, Bar and Sheet Iron—or to take orders for the same—all of favorite brands, and on the usual terms. ILLIUS & MAKIN.
41 Broad street.

March 29 1849. 3m.13

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,
Manufactured at the Glendon Mills, East Boston, for sale by GEORGE GARDNER & CO.,
5 Liberty Square, Boston, Mass.

Sept. 15, 1849. 3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES. — The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for rail roads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, *Agent.*
Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at factory prices, of Erastus Corning & Co Albany; Merritt & Co., New York; E. Pratt & Brother, Baltimore Md

LAP—WELDED WROUGHT IRON TUBES FOR TUBULAR BOILERS,

FROM 1 1-2 TO 8 INCHES DIAMETER.

These are the ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers

THOMAS PROSSER,
Patentee.
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron. THOMAS B. SANDS & CO.,
22 South William street,

February 3, 1849. New York.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,
Iron Merchants,
Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849. 1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention. J. F. WINSLOW, *President*
Troy, N.Y.
ERASTUS CORNING, Albany.
WARREN DELANO, Jr., N.Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phœnix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehannah river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.,
45 North Water St., Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR
IRON FOUNDRY AND MACHINE SHOP
In complete operation, are prepared to execute faithfully and promptly, orders for
Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,
Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing.
Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, warranted,
Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete

☞Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

☞ Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS, Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

American and Foreign Iron.

FOR SALE,

300	Tons	A 1,	Iron Dale	Foundry Iron.
100	"	1,	"	"
100	"	2,	"	"
100	"	"	Forge	"
400	"	Wilkesbarre	"	"
100	"	"Roaring Run"	Foundry	Iron.
300	"	Fort	"	"
50	"	Catoctin	"	"
250	"	Chikiswalungo	"	"
50	"	"Columbia" "chilling" iron, a very superior article for car wheels.		
75	"	"Columbia" refined boiler blooms.		
30	"	1 x ¼ Slit iron.		
50	"	Best Penna. boiler iron.		
50	"	"Puddled" "		
50	"	Bagnall & Sons refined bar iron.		
50	"	Common bar iron.		

Locomotive and other boiler iron furnished to order.

GOODHUE & CO.,
New York. 64 South street

American Pig, Bloom and Boiler Iron.

HENRY THOMPSON & SON,
No 57 South Gay St., Baltimore, Md.,

Offer for sale, *Hot Blast* Charcoal *Pig Iron* made at the *Catoctin* (Maryland), and *Taylor* (Virginia), *Furnaces; Cold Blast* Charcoal Pig Iron from the *Cloverdale* and *Catawba*, Va., Furnaces, suitable for *Wheels* or *Machinery* requiring *extra* strength; also *Boiler* and *Flue Iron* from the mills of Edge & Hilles in Delaware, and *best quality Boiler Blooms* made from *Cold Blast Pig Iron* at the *Shenandoah Works*, Va. The productions of the above establishments can always be had at the lowest market prices for approved paper.

American Pig Iron of other brands, and *Rolled* and *Hammered Bar Iron* furnished at lowest prices. Agents for *Watson's Perth Amboy Fire Bricks*, and Rich & Cos. New York Salamander Iron Chests.

Baltimore, June 14, 1849. 6 mos

LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers, from 1¼ to 15 inches diameter, and any length not exceeding 17 feet—manufactured by the Caledonian Tube Company, Glasgow, and for sale by

IRVING VAN WART,
12 Platt street, New York.

JOB CUTLER, *Patentee.*

☞ These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom.

Railroad Iron.

THE TRENTON IRON COMPANY ARE NOW turning out one thousand tons of rails per month, at their works at Trenton, N. J. They are prepared to enter into contract to furnish rails of any pattern, and of the very best quality, made exclusively from the famous Andover iron. The position of the works on the Delaware river, the Delaware and Raritan canal, and the Camden and Amboy railroad, enables them to ship rails at all seasons of the year. Apply to

COOPER & HEWITT, *Agents.*
October 30, 1848. 17 Burling Slip, New York.

Pig and Bloom Iron.

THE Subscribers are Agents for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniata Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by

A. WRIGHT & NEPHEW,
Vine Street Wharf, Philadelphia.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of Iron usually made at the works of the company, and offer for sale on advantageous terms.—

150	tons	No. 1 Boonton Foundry	Pig Iron.
100	"	No. 2 do.	do.
300	"	Nos. 2 & 3 Forge	do.
100	"	No. 2 Glendon	do.
140	"	Nos. 2 & 3 Lehigh Crane	do.
100	"	No. 1 Pompton Charcoal	do.
100	"	New-Jersey Blooms	
50	"	New-Jersey Faggoting Iron, for shafts	

Best Bars, ½ to 4 inch by ½ to 1 inch thick.
Do do Rounds and Squares, ½ to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, ½ to 1 in. Ovals & Half Ovals ½ to 1½ in.
Bands, 1½ to 4 inch. Hoops, ½ to 2 inch.
Trunk Hoops, ½ to 1½ in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS'
CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.
Best and 2d gy. Sheet Steel—for saws and other purposes.
German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.
Genuine "Sykes," L Blister Steel.
Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by WM. JESSOP & SONS,
91 John street, New York.

Also by their Agents—
Curtus & Hand, 47 Commerce street, Philadelphia.
Alex'r Fullerton & Co., 119 Milk street, Boston.
Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

SPRING STEEL FOR LOCOMOTIVES, TENDERS AND CARS.—The subscriber is engaged in manufacturing spring steel from 1½ to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address J. F. WINSLOW, *Agent,*
Albany Iron and Nail Works.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND

ENGINEERING AND MACHINE FILES,

which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & CO.,
100 William St., New York.
November 23 1849.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

To Steam Engine Builders.

THE Undersigned offer for sale, *at less than half its cost*, the following *new machinery*, calculated for an engine of 62 inches cylinder and 10 feet stroke, viz:

2 Wrought Iron Cranks, 60 inches from centre to centre.
1 Do. do. Connecting Rod Strap.
2 Do. do. Crank Pins.
1 Eccentric Strap.
1 Diagonal Link with Brasses.
1 Cast Iron Lever Beam (forked).

The above machinery was made at the West Point Foundry for the U. S. Steamer Missouri, without regard to expense, is all finished complete for putting together, and has never been used. Drawings of the cranks can be seen on application to

HENRY THOMPSON & SON,
No. 57 South Gay St., Baltimore, Md.
Sept. 12, 1849.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffers Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by

E. & G. W. BLUNT,
No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

Mattewan Machine Works.

THE Mattewan Company have added to their Machine Works an extensive LOCOMOTIVE ENGINE department, and are prepared to execute orders for *Locomotive Engines* of every size and pattern—also *Tenders, Wheels, Axles*, and other railroad machinery, to which they ask the attention of those who wish such articles, before they purchase elsewhere.

STATIONARY ENGINES, BOILERS, ETC.,
Of any required size or pattern, arranged for driving *Cotton, Woollen, or other Mills*, can be had on favorable terms, and at short notice.

COTTON AND WOOLLEN MACHINERY,
Of every description, embodying all the modern improvements, second in quality to none in this or any other country, made to order.

MILL GEARING,
Of every description, may be had at short notice, as this company has probably the most extensive assortment of patterns in this line, in any section of the country, and are constantly adding to them.

TOOLS.
Turning Lathes, Slabbing, Plaining, Cutting and *Drilling Machines*, of the most approved patterns, together with all other tools required in machine shops, may be had at the Mattewan Company's Shops, Fishkill Landing, or at 39 Pine street, New York.

WM. B. LEONARD, *Agent.*

NOTICE.

TO BRIDGE BUILDERS, BRIDGE COMPANIES, and *Other Individuals* and *Associations*, who have constructed or used Bridges involving the combined principle of *Bracing, Counter-bracing* and *Trussing* by means of counteracting braces, keys, wedges, screws, etc., as tet forth and explained in my Bridge Patent of 1830, in the words following, to wit: "*A system of Counter-bracing, by means of which the truss frames are rendered stiff and unyielding, and the bridge kept in uniform action whether loaded or unloaded*"—NOTICE is hereby given, that in all cases in which said combined principle has been introduced into bridges, without due license or authority from me, and without my having been duly remunerated therefor, will be regarded as infringements upon my rights and privileges, snd that an amicable adjustment and settlement of all my claims in the primeses may be effected by prompt application to my duly authorized Agents therefor, viz: Messrs. Clinton, Knight and Brother, of Cincinnati, Ohio, or Daniel A. Webster, Esq., 8 Pell street of the city of New York.

STEPHEN H. LONG, Patentee.
Louisville, December 10, 1849.

To Railroad Companies.

FOR SALE—A Second-hand Locomotive Engine and Tender, of about 10 tons weight, in good order, and *warranted to perform well.* Any company wanting a cheap engine for a passenger or light burden train, will rarely meet with an opportunity so favorable as the present. The engine and tender are in perfect running order, and will be tested to the satisfaction of any one wishing to purchase. Price $1,500.

Address J. B. MOORHEAD,
Frazer P.O., Chester county, Pa.

P.S.—The Engine can be seen by calling on H. Osmond & Co., Car-builders, Broad st., Philadelphia.

September 6, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—*Bearing and Buffer—Fuller's Patent—Hose* from 1 to 12 inches diameter. Suction Hose. *Steam Packing*—from 1-16 to 2 in. thick. *Rubber and Gutta Percha Bands.* These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,
Warehouse 23 Courtlandt street.

New York, May 21, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rafford's Stourbridge, Oak Farms Stourbridge, Lister, Wortley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also,

COAL,

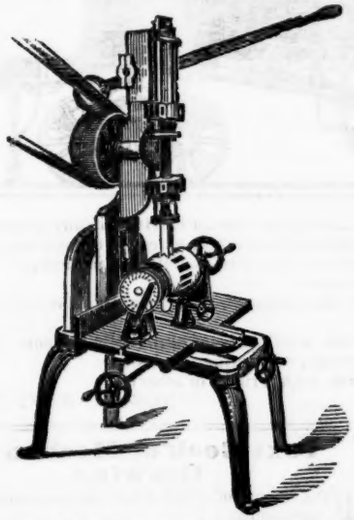
of all kinds—Liverpool Orrell and Cannel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthrecite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.

Capt. Alfred Swingle's PATENT BORING & MORTISING MACHINE.



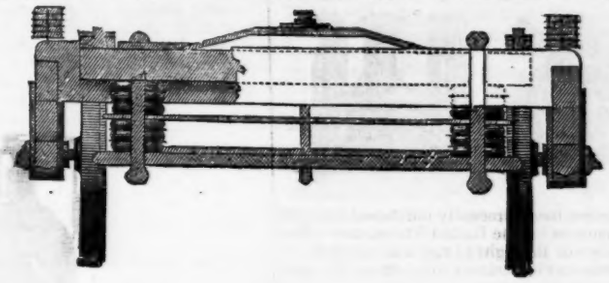
The above Machine was invented by A. SWINGLE, of Texas, in 1846, and Letters Patent were taken out in July, 1848. As a labor saving Machine it stands unrivalled even in these days of improvements. Its uses are innumerable; it may be successfully applied to Doors, Sashes, Carriages, Wheel-Hubs, and in fact to all kinds of work where the Auger and Chisel can be brought to bear.

The only limit to the speed of the working of this machine is the heating of the tools used. It will perform at least the labor of twelve men, and in vastly better manner, and can be worked equally well by steam power or by hand. It has been used and has given universal satisfaction.

For further information apply to H. B. TEBBETTS, 40 Wall St., New York, to whom all orders are to be addressed.

New York, December 15, 1849.

FULLER'S PATENT INDIA RUBBER CAR SPRINGS.



RAILROAD COMPANIES are cautioned, before purchasing Springs, to examine the actual patents and judge for themselves.

Persons, under the Title of the New England Car Company, seeking fraudulently to invade Fuller's rights have put forth so many statements for the purpose of misleading the public, that an enumeration of some facts is absolutely necessary, for the purpose of putting persons interested upon their guard.

Fuller's patent is for the application of Discs of India-rubber with Metal Plates, for forming Springs for Railway Cars and Carriages—either one disc and two plates, or ten discs and plates, or any other number, are equally covered by the patent. Fuller is not bound to the use of short discs—he may use long discs and plates.

Ray's patent is simply and wholly the forming of air tight rubber cylinders, with hoops or bands round the outside, and the combination of elasticity of India rubber, with the elasticity of atmospheric air confined in the cylinder, and in no part of his patent is he authorised to use the form of spring which he is now fraudulently supplying to Railroad Companies. Such springs are direct and positive infringements of the very letter of Fuller's patent.

Fuller's patent is dated October, 1845, Ray's patent, August, 1848.

The spring patented by Ray never has been put in operation, and never can be made useful for Railroad cars.

A mere experiment, even if made, it is well known does not prove an invention; and it is ridiculous for such parties to hope to mislead the Presidents and Superintendents of Railroad companies, by claiming the invention because Ray alledges he made an experiment—which Fuller had made before him—had actually brought into working order, and obtained a patent for—and this too before Mr. Ray states he made his experiment—and that experiment not claimed to have been applied to a car or carriage.

Besides, the invention could not have been developed until India rubber, properly Vulcanised, could be made of a sufficient thickness. In the United States the art of vulcanising rubber by steam heat, (by which means only can a body of rubber having any considerable thickness be vulcanised,) was not introduced until after the grant by the American government of the patent for springs to Fuller—whereas the process of vulcanising rubber by steam heat was invented in England about three years previously, and was used by Fuller there. This fact refutes entirely the claim of invention put forth by Mr. Ray, and proves the impossibility of his pretensions being true.

Fuller was the first and only inventor of the spring. A Mr. Dorr, whose connection with Mr. Goodyear is well known in this country, applied in England to Mr. Fuller, after he had published and patented his invention, and introduced another party for the purpose of obtaining the agency for the United States. They were furnished with a complete set of drawings and models, and with instructions to make arrangements for the supply of material of American manufacture—from that hour to the present not a single communication has been received from them. Some of these identical models have been traced into the hands of parties now seeking to invade Fuller's rights, and who have exhibited them as specimens of their own invention.

After this, the conveyance was made by Goodyear to certain parties here for the use for railroad springs of what he calls his Metallic rubber. Comment is unnecessary.

There are 5 or 6 different processes for the manufacture of vulcanised rubber, patented by as many different parties, some here, some in England, either of which would probably make good springs.

A large and powerful company has been organised under Fuller's patent, the particulars of which shall be given very shortly.

An action has been commenced against three railroad companies for infringement; and all other parties will assuredly be prosecuted if they continue farther to infringe upon Fuller's patent.

W. C. FULLER,

The only persons authorised to supply the Springs are G. M. KNEVITT, 38 Broadway, N. York, General Agent for the U. S.: and
JAS. LEE & Co., 18 India Wharf, Boston.
JOHN THORNLEY, Chestnut st., Philad.

Arch St. Machine Shop.

BIRKENBINE, MARTIN & TROTTER,
Makers of
STEAM ENGINES,
and
HYDRAULIC MACHINERY,
NO. 16 ARCH STREET,
PHILADELPHIA,

Will construct Steam Engines, Pumps, for Draining Mines and Land; supplying Water to Towns, Factories, Farms, etc;

Also, Street Stops, Fire Plugs, Water Tanks, and Hydraulic Rams, with
(BIRKINBINE'S PATENT VALVES.)

B., M. & T. contract for Warming and Ventilating Buildings by Steam or Warm Water.

J. E. Mitchell,

NO. 14 OLD YORK ROAD, PHILADELPHIA.
Importer and manufacturer of

New Castle, Nova Scotia, Wickersly	Grindstones, of all sizes and grits.
French Burr, Cocaheo, Cologne	Millstones, made to order, with all the recent improvements.
American and Patent compressed, Garnkirk	Fire Bricks and Tiles of various sizes.

Burr Blocks, Bolting Cloths, Mill Irons, etc.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Burtt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. G. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Steam Boiler Explosions.

THE Subscriber having been appointed sole Agent for Faber's Magnetic Water Gauge, is now ready to supply the trade, and also individuals with this celebrated instrument. Besides the greatest safety from explosion resulting from its use, it is a thorough check against careless stoking and feeding. In marine engines it will regulate the exact quantity required in the "blow off." Pamphlets containing full information, can be had free on application to the Agent,

JOSEPH P. PIRSSON,
Civil Engineer, 5 Wall st.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.

THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phœnixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has give universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll rounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y. P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery *for making Spikes*, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, *Agent*,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNdersigned are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNdersigned, the *Original Inventor* of the *Plate Wheel* with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

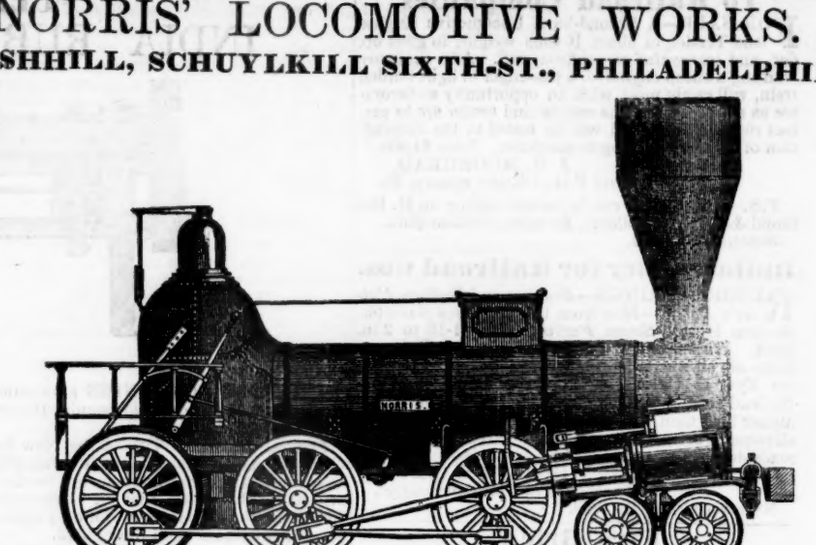
A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country. A. T.

Kensington, Philadelphia Co., }
March 12, 1848. }

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tires are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers, in tight papered barrels, by JOHN W. LAWRENCE,
142 Front-street, New York.

☞ Orders for the above will be received and promptly attended to at this office. 32 1y.

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest. P. A. BURDEN, *Agent*,
Troy Iron and Nail Factory, Troy, N. Y.

Text Book of Mechanical Drawing,

FOR the use of SCHOOLS and SELF-INSTRUCTION, containing,

1st. A series of progressive practical problems in Geometry, with full explanations, couched in plain and simple terms; showing also the construction of the *parallel ruler*, *plane scales* and *protractor*.

2d. Examples for drawing *plans*, *sections* and *elevations* of Buildings and Machinery, the mode of drawing elevations from *circular* and *polygonal* plans, and the drawing of Roman and Grecian Mouldings.

3d. An introduction to *Isometrical drawing*, with 4 plates of examples.

4th. A treatise on *Linear Perspective*, with numerous examples and full explanations, rendering the study of the art easy and agreeable.

5th. Examples for the projection of shadows.

The whole illustrated with 50 STEEL PLATES.

Published by WM. MINIFIE & CO.,
114 Baltimore St., Baltimore Md.

Price $3, to be had of all the principal booksellers.

MR. HALE:—"The New England Car Co., having been engaged for the last six months in introducing the Vulcanized India-rubber Car Spaings upon the different railroads in this and other states, and having in particular introduced it upon the Boston and Worcester railroad with perfect success, were much gratified to find, by your paper of this morning, that the article had given satisfaction to the president of that corporation, and the terms of just commendation in which you were pleased to speak of it. But their gratification was scarcely equalled by their surprise, when, or arriving at the close of your paragraph, they found the results of all their labors attributed to a foreign source, with which the New England Car Co. has no connection. The material used on the Boston and Worcester railroad, and all the other railroads in this country, where any preparation of India-rubber has been successfully applied, is entirely an American invention, patented in the year 1844 to Charles Goodyear, of New Haven, Conn., and the application of it to this purpose and the form in which it is applied are the invention of F. M. Ray of New York. The only material now in use, and so far as has yet appeared, the only preparation of India rubber capable of answering the purpose, has been furnished under these patents by the New England Car Company, manufactured under the immediate inspection of their own agent. If any other should be produced, the right to use it would depend upon the question of its interference with Mr. Goodyear's patent. The New England Car Company have their place of business in this city at No. 99 State street, and are prepared to answer all orders for the Vulcanised India rubber Car Springs, of the same quality and of the same manufacture as those which they have already placed on your road, and most fo the other roads terminating in this city."

And yet Mr. Knevitt is using these experiments made upon the Springs of the Car Company to induce the public to purchase his springs, and is attempting to impose upon them the belief that the springs used were furnished by him! We ask whether such a course is honorable, or entitles his statements to much consideration from the public.

The above Springs are for sale 98 Broadway, New York, and 99 State street, Boston.

EDWARD CRANE Agent, Boston.
F. M. RAY, Agent, New York.

Boston, May 8, 1849.

NICOLL'S PATENT SAFETY SWITCH FOR Railroad Turnouts. This invention for some time in successful operation on one of the principal railroads in the country, effectually prevents engines and their trains from running off the track at a switch, left wrong by accident or design. It acts independently of the main track rails; being laid down or removed without cutting or displacing them.

It is never touched by passing trains, except when in use, preventing their running off the track. It is simple in its construction and operation, requiring only two castings and two rails; the latter, even if much worn or used, not objectionable.

Working models of the Safety Switch may be seen at Messrs. Davenport, Bridges & Kirk's Cambridge Port, Mass., and at the office of the Railroad Journal, New York.

Plans, Specifications, and all information obtained, on application to the Subscriber, Inventor and Patentee.

G. A. NICOLLS,
Reading, Pa.

RAILROADS.

BOSTON AND MAINE RAILROAD.

Fall Arrangement, 1849.

Outward Trains from Boston

For Portland at 7 am. and 2½ pm.
For Rochester at 7 am., 2½ pm.
For Great Falls at 7 am., 2½, 5 pm.
For Haverhill at 7 and 11½ am., 2½, 5, 7 pm.
For Lawrence at 7, 9, 11½ am., 2½, 5, 7 pm.
For Reading 7, 9 11½ am., 2½, 5, 6, 7 and 9½* pm.

Inward trains for Boston

From Portland at 8½ am., 4 pm.
From Rochester at 9½ am., 5 pm.
From Great Falls at 6½, 10½ am., 5½ pm.
From Haverhill at 6½, 8½ am., 12 m. 3, 7½ pm.
From Lawrence at 6½, 8½, am., 12½, 1½, 3½, 7½, pm.
From Reading at 6, 7½, 9½, am., 12½, 2, 3½, 6½, 8½ pm.

MEDFORD BRANCH TRAINS.

Leave Medford, at 6½, 7½ and 10 am. 2, 4, 6, and 7, pm.
Leave Boston, at 7, and 9½ am., 12½, 2½, 5½, 6½, 9½* pm.

*On Thursday Evenings, 2 hours, and on Saturday Evenings, 1 hour later.

CHAS. MINOT, Super't.

August 17, 1849.

EASTERN RAILROAD.

WINTER ARRANGEMENT.

On and after Monday, October 8, 1849, trains leave Boston daily (Sundays excepted);

For Lynn, 7, 8½, 10 a.m., 12½, 2½, 4, 4½, 6½, p.m.
Salem, 7, 8½ 10, a.m., 12½, 2½, 4, 4½, 6½, p.m.
Manchester and Gloucester, 10 a.m., 4 p.m.
Newburyport, 7, a.m., 12½, 2½ 4½, p.m.
Portsmouth, 7, am., 2½, 4½, pm.
Portland, Me., 7, am., 2½, pm.

And for Boston,

From Portland, 8½ am., 4 pm.
Portsmouth, 7, 10½*, am., 6½*, pm.
Newburyport, 7½, 11½*, am., 3½ 7*, pm.
Gloucester, 7½, am., 1½pm.
Manchester, 8 am., 2 pm.,
Lynn, 7½, 8½*, 9½*, 10½ am., 12 55*, 2½* 4½* 8½* pm.
Salem, 7½, 8½*, 9*, 10½ am., 12 40*, 2½* 4½,* 8*, pm.

**Or on their arrival from the East.*

Freight trains each way daily. Office 17 Merchants' Row, Boston.

Feb. 3. JOHN KINSMAN, Superintendent.

BOSTON & LOWELL RAILROAD.

Passenger trains run as follows, viz:

Upper Railroad Trains.

Leave Boston at 7½ a.m., 12 m. and 4½ p.m.
Leave Lowell at 8 a.m., 1 40 m. and 7 p.m.

Accommodation Trains.

Leave Boston at 7 5 and 9½ a.m., 2½, & 6½ p.m.
Leave Lowell at 7 and 10 a.m., 3½, and 6 p.m.

Woburn Branch Trains.

Leave Woburn Centre at 6½, 7½, and 9½, a.m., 1½ 4½ p.m.
Leave Boston at 8½, 11½ a.m., 3, 5½ and 7 p.m.

On Saturdays, an extra train leaves Woburn centre at 9 p.m. and Boston at 10 p.m.

WALDO HIGGINSON,
Agent Boston and Lowell Railroad Cor.

Boston, October 5, 1849. 22tf.

FITCHBURG RAILROAD.

On and after Monday, October 1, 1849, trains will run as follows:—

Express train leaves Boston at 7½ a.m. with passengers for the Vermont and Massachusetts, Cheshire, Rutland, Sullivan, Vermont Central, and Passumpsic Railroads. The Express train will run up without any stops, excepting for wood and water.

Accommodation Up Trains.

For Fitchburg, 6 50 and 11 a.m., 5½ p.m.
West Townsend, 6 50 and 11 a.m., and 5½ p.m.
Groton, 6 50 and 11 a.m., 5½ p.m.
Concord, 6 50 and 11 a.m., 5½ and 6½ p.m.
Waltham, 6 50, 8, 10, 11 a.m., 1½, 4½, 5½, 6½ p.m.
Fresh Pond, Mount Auburn and Watertown, 7 5 and 10½ a.m., 12 m., 2 20, 4½ and 6½ p.m.
West Cambridge and Lexington, 8½ a.m., 2½, & 5½ p.m.

Down Trains.

From Fitchburg, 7 50 a.m., 12 m., 1 17 and 6½ p.m.
West Townsend, 7½ a.m., 12 m., and 6½ p.m.
Groton, 8 20 a.m., 12½, 1 47 and 7 20 p.m.
Concord, 6 50, 9 a.m., 1 12, 2 25 and 7 55 p.m.
Waltham, 7½, 8 50, 9 25 and 11 a.m., 1 35, 2 50, 4, 5 45, and 8 22 p.m.
West Cambridge and Lexington, 7½ & 10 a.m., and 4½ p.m.
Fresh Pond, Mount Auburn and Watertown, 6½, 8 and 11 a.m., 1½, 3½ and 6 p.m.

S. M. FELTON, Sup't.

Boston, October 1, 1849.

ALBANY AND BUFFALO RAILROADS.—Four Trains daily, Sundays excepted, viz:

Leave Albany, 6 a.m., 9 a.m., 2 p.m., 7 p.m.
Reach Buffalo, 15 hours, 18 hours, 23 hours, 18 hours.
Arrive from Buffalo, 7 p.m., 2½ a.m., 12½ m., 3½ p.m.

Passengers by the *Express Train* reach Buffalo from New York, and New York from Buffalo, in 24 hours. The Isaac Newton and Oregon connect at Albany with this Train. Baggage cars, with careful baggage masters, run through with all the trains.

For Schenectady, Saratoga Springs & Whitehall,

Leave Albany at 7 a.m. and 2 p.m. For Schenectady only at 6, 7 and 9 a.m. and 12½, 2 and 7 p.m. For Erie Canal packets at 7 a.m. and 7 p.m. By Plank Road from Schenectady to Saratoga at all hours by stages, etc.

The *Eastern Trains* leave Albany at 7 a.m. and 3 p.m. The wagons of the company take baggage *free* between railroads and steamboats at Albany.

E. FOSTER, Jr., Sec'y
Albany and Schenectady Railroad Co.

Albany, August, 1849.

NEW YORK AND HARLEM RAILROAD.

NEW ARRANGEMENT.

On and after Wednesday, October 17th, 1849, the Cars will run as follows, (Sundays excepted) until further notice:

Trains will leave the City Hall, New York, for—

Harlem and Morrisania at 6½, 8, 10, 11, 12 am., 2, 3½, 4, 5, 6½ pm.
New Village, at 8½, 10, 12 am., 3½, 5, 6½ pm.
Fordham and Williams' Bridge, at 8½, 10, 12 am., 2½ 3½, 5, 6½ pm.
Hunt's Bridge, Underhill's and Hart's Corners, at 8½, 10 am., 3½, 5 pm.
Tuckahoe and White Plains, at 8½, 10 am., 2½, 3½, 5 pm.
Pleasantville, New Castle, Bedford, Mechanicsville, Purdy's, Croton Falls, and intermediate stations, on signal, 8½ am., 2½, 3½ pm.
Brewster's, Towner's, Patterson, Paulding's, South Dover, Dover Furnace, and Dover Plains, 8½ am., 2½ pm.

NOTICE—Passengers are reminded of the great danger of standing upon the platform of the cars, and hereby notified that the practice is contrary to the rules of the Company, and that they do not admit any responsibility for injury sustained by any passenger upon the platforms, in case of accident.

Returning to New York will leave

Harlem and Morrisiana at 6 08, 7½, 8 37, 9, 10 6, 12 am., 1 43, 3 07, 3½, 5, 5 47 pm.
New Village, at 5 58, 8 27, 9 56 am., 1 33, 2 57, 5 36 pm.
Fordham and William's Bridge at 5½, 8 14, 9 43, 10 57 am., 1 20, 2 44, 5 24 pm.
Hunt's Bridge at 8 04, 9 33 am., 2 34, 5 16 pm. On signal.
Underhill's, at 7 56, 9 23 a.m., 2 26, 5 10 p.m. On signal.
Tuckahoe at 7 53, 9 18, 10 40 am., 2 23, 5 08 pm.
Hart's Corners at 7 38, 9 03 am., 2 08, 4 54 pm.—On signal.
White Plains at 7½, 8 55, 10 20 am., 2, 4 47 pm.
Davis' Brook at 8 40, 10 11 am., On signal. 4 39 pm. On signal.
Unionville, 8 27, 10 11 am. On signal. 4 29 pm.—On signal.
Pleasantville at 8 20, 9 56 am., 4 24 pm.
Champaqua, at 8 10, 9 50 am. On signal. 4 18 pm. On signal,
New Castle, at 7 56, 9 38 am.. 4 07 pm.
Bedford at 7 46, 9 32 am., 4 02 pm.
Mechanicsville at 7 36, 9 22 am., 3 52 pm.
Golden's Bridge, 7 28, 9 17 am. On signal, 3 47 p m. On signal.
Purdy's at 7 20, 9 09 am., 3 39 pm.
Croton Falls, at 7½, 9 04 am.,3 34 pm.
Brewster's, at 8 50 am., 3 20 pm.
Towner's, at 8 35 am., 3 05 pm.
Paterson, at 8 27 am., 2 57 pm.
Paulding's, at 8 17 am., 2 47 pm.
South Dover, 8 02 am., 2 32 pm.
Dover Furnace, 7 55 am., 2 25 pm.
Dover Plains, at 7 45 am., 2 15 pm.

The trains for Harlem and Morrisiana leaving City Hall at 6½, 8, 10, 11, 12, 2, 4 and 6½, returning from Morrisiana and Harlem at 6 08, 7½, 9, 12, 1 43, 3 07, 3½ and 5 o'clock, will land and receive passengers at 27th 42d, 51st, 61st, 79th, 86th, 109th, 115th, 125th and 132d streets.

The Dover Plains train from New York at 2½ pm., returning leaving Dover Plains at 7½ am., will not stop between White Plains and New York, (except at Tuckahoe, Williams' Bridge and Fordham,) unless to leave passengers coming from above Croton Falls.

A car will precede each train ten minutes to take up passengers in the city. The last car will not stop, except at Broome st. and 27th street.

Freight Trains leave New York at 1 o'clock pm.—Returning, leaves Dover Plains at 12 o'clock m.

For Sunday Aarrangements, see hand bills.

M. SLOAT, Sup't.

ST. LAWRENCE & ATLANTIC RAILROAD COMPANY.

Notice is hereby given that the Trains run twice per day between Montreal and St. Hyacinthe, leaving each terminus alternately, until further notice.

Leaverng St. Hyacinth at	- -	7 am.
" "	- -	3 pm.
Leaving Montreal at	- - -	10 am.
" "	- - -	6 pm.

THOMAS STEERS, *Secretary.*

May 31, 1849.

NEW YORK AND ERIE RAILROAD. OPEN TO ELMIRA.

On and after the 8th of October, the trains will run as follows, (Sundays excepted):

THROUGH PASSENGER TRAINS from New York to Elmira, will leave the Company's Pier at the foot of Duane street, at 7 o'clock a.m. and 5 o'clock p.m. stopping at all the way stations.

From Elmira the through trains will leave for New York at 5 o'clock a.m. and 6½ p. m., stopping also at all the way stations.

A SPECIAL WAY TRAIN, for Port Jervis and intermediate stations, except Sufferns, will leave New York every Saturday at 3 p. m., and will leave Port Jervis for New York every Monday morning, at 4 55 o'clock.

A MILK TRAIN, with Passenger Cars attached, will leave Port Jervis for New York at 3 o'clock a.m. and returning will leave New York for Port Jervis at 3 p.m. Another milk train with passenger car, will leave Piermont for Otisville at 9 am., and returning leave Otisville at 4 55 p.m., connecting with the freight boats to New York. The milk trains do not connect with the P. and R. railroad.

FREIGHT.—Freight leaves New York every night for all the regular stations on the road. A freight train will leave Elmira every morning at 3 20 o'clock a.m. —A freight train will leave Port Jervis for New York every morning at 5 o'clock, and another at 8 a.m. with market freights.

A Special Train for cattle and other live stock, will leave Elmira on Tuesdays and Fridays at 12 20 p.m.; and from Port Jervis, for New York, on Wednesdays and Saturdays, at 8 40 a.m.

FARE from New York to Elmira $5 75. The intermediate stations in proportion.

COMMUTATION TICKETS, at lower rates, for the stations between New York and Port Jervis, can be purchased at the New York and Piermont offices.

The Steamboat ERIE leaves New York for Piermont every day at 3 o'clock, and returns on the arrival of the train from Elmira, arriving at New York at about 7½ p.m.

JAMES P. KIRKWOOD, Superintendant.

GEORGIA RAILROAD. FROM AUGUSTA TO ATLANTA—171 MILES.

AND WESTERN AND ATLANTIC RAILROAD, FROM ATLANTA TO DALTON, 100 MILES.

This Road, in connection with the South Carolina Railroad, and Western and Atlantic Railroad, now forms a continuous line, 408 miles in length, from Charleston to Dalton Cross Plains) in Murray county, Ga. 32 miles from Chattanooga, Tenn.

RATES OF FREIGHT.

		Between Augusta and Dalton. 271 miles.	Between Charleston, and Dalton. 408 miles.
1st class	Boxes of Hats, Bonnets, and Furniture, per cubic foot	$0 18	$0 28
2d class	Boxes and Bales of Dry Goods, Saddlery, Glass, Paints, Drugs, and Confectionary, per 100 lbs.	1 00	1 50
3d class	Sugar, Coffee, Liquor, Bagging, Rope, Cotton, Yarns Tobacco, Leather, Hides, Copper, Tin, Feathers, Sheet Iron, Hollow ware, Castings, Crockery, etc.	0 60	0 85
4th class	Flour Rice, Bacon, Pork, Beef, Fish, Lard, Tallow, Beeswax, Bar Iron, Ginseng, Mill Gearing, Pig Iron, and Grindstones, etc.	0 40	0 65
	Cotton, per 100 lbs.	0 45	0 70
	Molasses per hogshead	8 50	13 50
	" " barrel	2 50	4 25
	Salt per bushel	0 18	
	Salt per Liverpool sack	0 65	
	Ploughs, Corn Shellers, Cultivators, Straw Cutters, Wheelbarrows	0 75	1 50

German or other emigrants, in lots of 20 or more, will be carried over the above roads at 2 cents per mile.

Goods consigned to S. C. Railroad Company will be forwarded free of commissions. Freights payable at Dalton.

F. C. ARMS,
Sup't of Transportation.

44*1y

LITTLE MIAMI RAILROAD.—SUMMER ARRANGEMENT.

CINCINNATI & SANDUSKY.

FIRST Passenger Train leaves Depot on East Front street, at 5 o'clock 10 minutes A. M. stops for breakfast at Morrow, and arrives at Springfield at 11 10 A. M. Leaves Springfield for Sandusky at 11 50 A. M.

Second Passenger Train leaves Depot 3 P. M. arrives at Springfield at 9 P.M. Passengers take tea at Springfield, and leaves for Sandusky at 9½ P. M.

RETURNING—First Train leaves Springfield at 4 A. M. Stop for breakfast at Xenia, and arrives at Cincinnati at 10 15 A. M.

Second Train leaves Springfield at 2½ P. M. Stop for tea at Morrow, and arrives at cincinnati, at 8½ P. M.

Passengers taking the Morning Train arrive at Sandusky at 9 P. M. Those taking the Afternoon Train arrive at 7½ A. M. next morning, and proceed directly on in the boats.

Passengers for columbus, Zanesville, Wheeling, and intermediate towns, should take the 5, 10 A. M., Train.

The Ohi Stage Company are running the following Lines in connection with the Trains:

A Daily Daylight Line to Columbus from Springfield in connection with the Morning Train from Cincinnati. Also, Daily Lines to Columbus, from Xenia and Springfield, connecting with the 3 o'clock, pm. Train from Cincinnati.

Fare from Cincinnati to	Xenia		$1 90
Do	do	Springfield	2 50
Do	do	Sandusky City	6 50
Do	do	Buffalo	10 00
Do	do	Columbus	4 50

For other information and through tickets, apply at the Ticket Office on Broadway, near Front-st., Cincinnati.

W. H. CLEMENT, Superintendent.

☞ The Company will not be responsible for Baggage exceeding 50 dollars in value, unless the same is returned to the Conductors or Agent, and freight paid at the rate of a passage for every 500 dollars in value above that amount.

BALTIMORE AND OHIO RAILROAD, MAIN STEM.

The Train carrying the Great Western Mail leaves Baltimore every morning at 7½, and Cumberland at 8 o'clock, passing Ellicott's Mills, Frederick, Harper's Ferry, Martinsburgh and Hancock, connecting daily each way with—the Washington Trains at the Relay House seven miles from Baltimore, with the Winchester Trains at Harper's Ferry—with the various railroad and steamboat lines between Baltimore and Philadelphia, and with the lines of Post Coaches between Cumberland and Wheeling and the fine Steamboats on the Monongahela Slack Water between Brownsville and Pittsburgh. Time of arrival at both Cumberland and Baltimore 5½ P. M. Fare between these points $7, and 4 cents per mile for less distances.—Fare through to Wheeling $11, and time about 36 hours, to Pittsburgh $10, and time about 32 hours.—Through tickets from Philadelphia to Wheeling $13, to Pittsburgh $12. Extra train daily, except Sundays, from Baltimore to Frederick at 4 P. M., and from Frederick to Baltimore at 8 A. M.

WASHINGTON BRANCH.

Daily trains at 9 A. M., and 5 P. M., and 12 at night from Baltimore, and at 6 A. M. and 5½ P. M. from Washington, connecting daily with the lines North, South and West, at Baltimore, Washington, and the Relay House. Fare $1 60 through between Baltimore and Washington, in either direction, 4 cents per mile for intermediate distances. s13 y1

PHILADELPHIA, WILMINGTON, & BALTIMORE RAILROAD.

Summer Arrangement.
April 1st, 1849.—Fare $3.

Leave Philadelphia 8½ am., and 10 pm.
Leave Baltimore 9 am, and 8 pm.
Sunday—Leave Philadelphia at 10 pm.
" " Baltimore at 8 pm.
Trains stop at way stations.

Charleston, S. C.
Through tickets Philadelphia to Charleston, $20.

Pittsburg and Wheeling.
Through ticket, Philadelphia to Pittsburg, $12.
" " Wheeling, 13.
Through tickets sold at Philadelphia office only.

Wilmington Accommodation.
Leave Philadelphia at 12 m. 4 and 7 pm.
Leave Wilmington at 7½ am., 4½ and 7 pm.

Newcastle Line.
Leave Philadelphia at 2½ pm.—Baltimore at 1½ pm
Fare $3.—Second class, $2.
N.B.—Extra baggage charged for.

I. R TRIMBLE, Gen. Supt.

PHILADELPHIA & READING RAILROAD. Passenger Train Arrangement for 1848.

A Passenger Train will leave Philadelphia and Pottsville daily, except Sundays, at 9 o'clock am.

The Train from Philadelphia arrives at Reading at 12 18 m.

The Train from Pottsville arrives at Reading at 10 43 am.

Fares.	Miles.	No. 1.	No. 2
Between Phila. and Pottsville,	92	$3.50 and	$3.00
" " Reading	58	2.25 and	1.90
" Pottsville "	34	1.40 and	1.20

Five minutes allowed at Reading, and three at other way stations.

Passenger Depot in Philadelphia corner of Broad and Vine streets. 8tf.

BALTIMORE AND SUSQUEHANNA RAILROAD.—Reduction of Fare. Morning and Afternoon Trains between Baltimore and York.—The Passenger Trains run daily, except Sundays, as follows:

Leave Baltimore at	9 am. and 3½ pm.
Arrive at	9 am. and 6½ pm.
Leave York at	5 am. and 3 pm.
Arrive at	12½ pm. & 8 pm.
Leave York for Columbia at	1½ pm. & 8 am.
Leave Columbia for York at	8 am. & 2 pm.

Fare:

Fare to York	$1 50
" Wrightsville	2 00
" Columbia	2 12½

Way points in proportion.

PITTSBURG, GETTYSBURG, AND HARRISBURG.

Through tickets to Pittsburg via stage to Harrisburg	$9
Or via Lancaster by railroad	10
Through tickets to Harrisburg or Gettysburg	3

In connection with the afternoon train at 3½ o'clock, a horse car is run to Green Spring and Owing's Mill, arriving at the Mills at 5½ pm.
Returning, leaves Owing's Mills at 7 am.

D. C. H. BORDLEY, Sup't.
31 1y Ticket Office, 63 North st.

CENTRAL RAILROAD—FROM SAVANNAH to Macon. Distance 190 miles.

This Road is open for the transportation of Passengers & Freight

Rate of Passage	$8 00. Freight—
On weight goods generally,	50 cts. per hundred
On measurement goods	13 cts. per cubic ft.
On brls. wet (except molasses and oil)	1 50 per barrel.
On brls. dry (except lime)	80 cts. per barrel.
On iron in pigs or bars, castings for mills, and unboxed machinery	40 cts. per hundred
On hhds. and pipes of liquor, not over 120 gallons	$5 00 per hhd.
On molasses and oil	$6 00 per hhd.

Goods addressed to F. WINTER, Agent, forwarded free of commission.

THOMAS PURSE,
Gen'l Sup't Transportation.

SOUTH CAROLINA RAILROAD.—A PASSENGER Train runs daily from Charleston, on the arrival of the boats from Wilmington, N. C., in connection with trains on the Georgia, and Western and Atlantic Railroads—and by stage lines and steamers connects with the Montgomery and West Point, and the Tuscumbia Railroad in N. Alabama.

Fare through from Charleston to Montgomery daily	$26 50
Fare through from Charleston to Huntsville, Decatur and Tuscumbia	22 00

The South Carolina Railroad Co. engage to receive merchandize consigned to their order, and to forward the same to any point on their road; and to the different stations on the Georgia and Western and Atlantic Railroad; and to Montgomery, Ala., by the West Point and Montgomery Railroad.

JOHN KING, Jr., Agent.

Railroad Lanterns.

COPPER and Iron Lanterns for Railroad Engines, fitted with heavy silver plated Parabolic Reflectors of the most approved construction, and Solar Argand Lamps; manufactured by

HENRY N. HOOPER & CO.,
No. 24 Commercial St. Boston.
August, 16, 1849. 6m33

THE WESTERN AND ATLANTIC RAILROAD.—This Road is now in operation to Oothcaloga, a distance of 80 miles, and connects daily (Sundays excepted) with the Georgia Railroad.

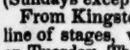
From Kingston, on this road, there is a tri-weekly line of stages, which leave on the arrival of the cars on Tuesday, Thursday and Saturday, for Warrenton, Huntsville, Decatur, and Tuscumbia, Alabama, and Memphis, Tennessee.

On the same days the stages leave Oothcaloga for Chattanooga, Jasper, Murfreesborough, Knoxville and Nashville, Tennessee.

This is the most expeditious route from the east to any of these places.

CHAS. F. M. GARNETT,
Chief Engineer

GREAT NORTHERN & SOUTHERN MAIL ROUTE. From New York to Charleston, S. C. daily, via *Philadelphia, Baltimore, Washington City, Richmond, Petersburg, Weldon and Wilmington, N. C.*



Travellers by this route, leaving New York at 4½ p. m., Philadelphia at 10 p.m., and Baltimore at 6 a.m., proceed without delay at any point on the route, arriving at Richmond, Va., in a day, and at Charleston, S. C., in two and half days from New York.

Through tickets from New York to Charleston, $20 00
" " Baltimore to Richmond, 7 00
" " " " Petersburg, 7 50

For tickets to Richmond and Petersburg, or further information, apply at the *Southern Ticket Office, adjoining the Washington Railroad Ticket Office, Pratt Street, Baltimore* STOCKTON & FALLS.

October, 1849.

CORROSIVE SUBLIMATE.

THIS article now extensively used for the preservation of timber, is manufactured and for sale by POWERS & WEIGHTMAN, manufacturing Chemists, Philadelphia.

Jan. 20, 1849.

NORRIS' LOCOMOTIVE WORKS,

SCHENECTADY, N. Y.

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch.

Chilled Wheels for Cars, Tucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by

E. S. NORRIS.

April 11, 1849.

To Railroad Companies, etc.

The undersigned has at last succeeded in constructing and securing by letters patent, a Spring Pad-lock which is secure, and cannot be knocked open with a stick, like other spring locks, and therefore particularly useful for locking Cars, and Swiiches, etc.

Companies that are in want of a good Pad-lock, can have open samples sent them that they may examine and judge for themselves, by sending their address to C. LIEBRICH,

46 South 8th St., Philadelphia.

November 3, 1849. 6m*

Engine and Car Works,

PORTLAND, MAINE.

THE PORTLAND COMPANY, Incorporated August 8th, 1846, with a capital of $250,000, have erected their extensive Works upon the deep water of Portland Harbor, and receive and transport, to and from their works direct, to and from vessels of any class.

They now manufacture to order, and deliver upon the Railroads running in each direction from the city, or on shipboard as wanted, Locomotive, Stationary, or Steam Boat Engines; Passenger, Mail, Freight, Earth and Hand Cars; Railway Frogs, Switches, Chairs and Castings; and every other description of Machinery. HORACE FELTON,

Superintendent.

JAMES C. CHURCHILL,
General Agent and Clerk.

C. W. Bentley & Co,

IRON Founders, Portable Steam Engine Builders and Boiler Makers, Corner Front and Plowman Sts., near Balttmore St. Bridge,

BALTIMORE, MARYLAND.

Their Engines are simple in their construction, compact and durable; they require no brick work in setting them, and occupyidg but a small space (a six horse power engine and boiler, standing on a cast iron plate of three by six feet.)

They also manufacture Major W. P. Williamson's new oscillating Engine; a superior article, combining cheapness and simplicity (one of which may be seen in operation at their shop.) Both of these engines are adapted to any purpose where power is required, and may be made of any capacity; and for economy in use of fuel are unsurpassed.

All kinds of machinery made to order. Steam Generators, Force Pumps, Wrought Iron Pipes and Fillings for Steam, Water, Gas, etc., constantly on hand,

Baltimore, June 6, 1849.

PHILADELPHIA CAR MANUFACTORY,

CORNER SCHUYLKILL 2D AND HAMILTON STS.,

SPRING GARDEN, PHILADELPHIA CO., PA.

Kimball & Gorton,

Having recently constructed the above works, are prepared to construct at short notice all kinds of

RAILROAD CARS, Viz:

Passenger Cars of all classes—Open and Covered Freight and Express Cars—Coal Cars—Hand Cars & Trucks of all descriptions.

They are also prepared to furnish Chilled Wheels of any pattern. Car Wheels & Axles fitted and furnished. Snow Ploughs and Tenders made to order. Steel and other Springs always on hand.

All orders will be filled at short notice, and upon as good terms as at any other establishment in the country.

Omnibuses from the Exchange run within one square of the manufactory every 10 minutes during the day.

Philadelphia, June 16, 1849. 1y25

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorised to make it, is warranted to stand as high a degree of heat *as any that has been or can be made by any person*—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thicknesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc. at the warehouse. JOHN GREACHEN, JR.,

98 Broadway, opposite Trinity Church.

New York, October, 1849.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, *Railroad* and *Depot Scales*, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain;—and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuylkill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.

New York and Erie Railroad.

And other principal Railroads in the Western, Middle and Southern States.

E. & F. FAIRBANKS & CO.
St. Johnsbury, Vt.

Agents, { FAIRBANKS & Co., 81 Water St., N. York.
A. B. NORRIS, 196 Market St. Philadelphia.

April 22, 1849. 1y*17

Coal.

CUMBERLAND SEMI-BITUMINOUS COAL superior quality for Locomotives, for sale by

H. B. TEBBETTS,
No. 40 Wall St., New York.

May 12, 1849. 1m19

ENGINEERS' AND SURVEYERS'

INSTRUMENTS MADE BY

EDMUND DRAPER,

Surviving partner of

STANCLIFFE & DRAPER.

No 23 Pear street, below Walnut,
0 near Third, Philadelphia.

CAR MANUFACTORY

CINCINNATI, OHIO.

KECK & DAVENPORT WOULD RESPECTfully call the attention of Railroad Companies in the West and South to their establishment at Cincinnati. Their facilities for manufacturing are extensive, and the means of transportation to different points speedy and economical. They are prepared to execute to order, on short notice, Eight-Wheeled Passenger Cars of the most superior description. Open and Covered Freight Cars, Four or Eight-Wheel Crank and Lever Hand Cars, Trucks, Wheels and Axles, and Railroad Work generally.

Cincinnati, Ohio, Oct. 2, 1848. 44ti

MACHINE WORKS OF ROGERS KETCHUM & GROSVENOR, *Patterson, N. J.* The undersigned receive orders for the following articles manufactured by them of the most superior description in every particular. Their works being extensive, and the number of hands employed being large, they are enabled to execute both large and small orders with promptness and dispatch.

Railroad Work.—Locomotive Steam Engines and Tenders; Driving and other Locomotive Wheels, Axles Springs and Flange Tires; Car Wheels of Cast Iron a variety of patterns and chills; Car Wheels of Cast Iron with wrought tires; Axles of best American refined iron; springs; boxes and bolts for cars.

Cotton, Wool and Flax Machinery of all descriptions and of the most improved patterns, style and workmanship.

Mill gearing and millwright work generally, hydraulic and other presses; press screws; callenders; lathes and tools of all kinds; iron and brass castings of all descriptions.

ROGERS, KETCHUM & GROSVENOR,
Patterson, N. J., or 60 *Wall St., New York.*

Plumbago, or Black Lead,

BLACK LEAD IN ITS CRUDE STATE, AND Black Lead Paints, prepared for various purposes. This paint is peculiarly adapted for the covering of all kinds of iron railing, or iron work wherever exposed; such as railroad bars, anchors, bolts for vessels, etc.—It makes the most durable paint to protect woodwork from moisture, and the indestructable nature of the body of it peculiarly fits it for covering the inside of depots, roofs of buildings, and all wood work exposed to fire.

The mine from which this article is taken is near Raleigh N. C. It has been examined by many of the most scientific men in this country, who all concur in pronouncing it of the best quality. In the fourth vol. of the American Journal of science, Professor Silliman speaks of it in the following manner. "The Plumbago from North Carolina is of a very fine quality and appears well adapted for pot & crayons." Professor Dewy speaks of it "as the finest he ever saw." Professor Olmstead, now of Yale College in his geological report of the State of North Carolina, Page 5 says.—"Not long since I received a letter from a gentleman in Vermont who contemplated setting up the manufacture of Black Lead Pots or Crucibles, requesting some particulars respecting this Plumbago, having been informed on the highest authority, that it was the best that could be procured within the United States."

It is a very fine article and superior for Pencils also for Crusibles, Pots etc., when the composition of silicious minerals is properly made to suit it, and may be had in any reasonable quantities of the subscriber on liberal terms at Raleigh North Carolina or at James Holdene 55 West St. New York.

Sep., 7th 1849. Richard Smith,

FOWLER M. RAY'S
METALLIC INDIA RUBBER CAR SPRINGS.

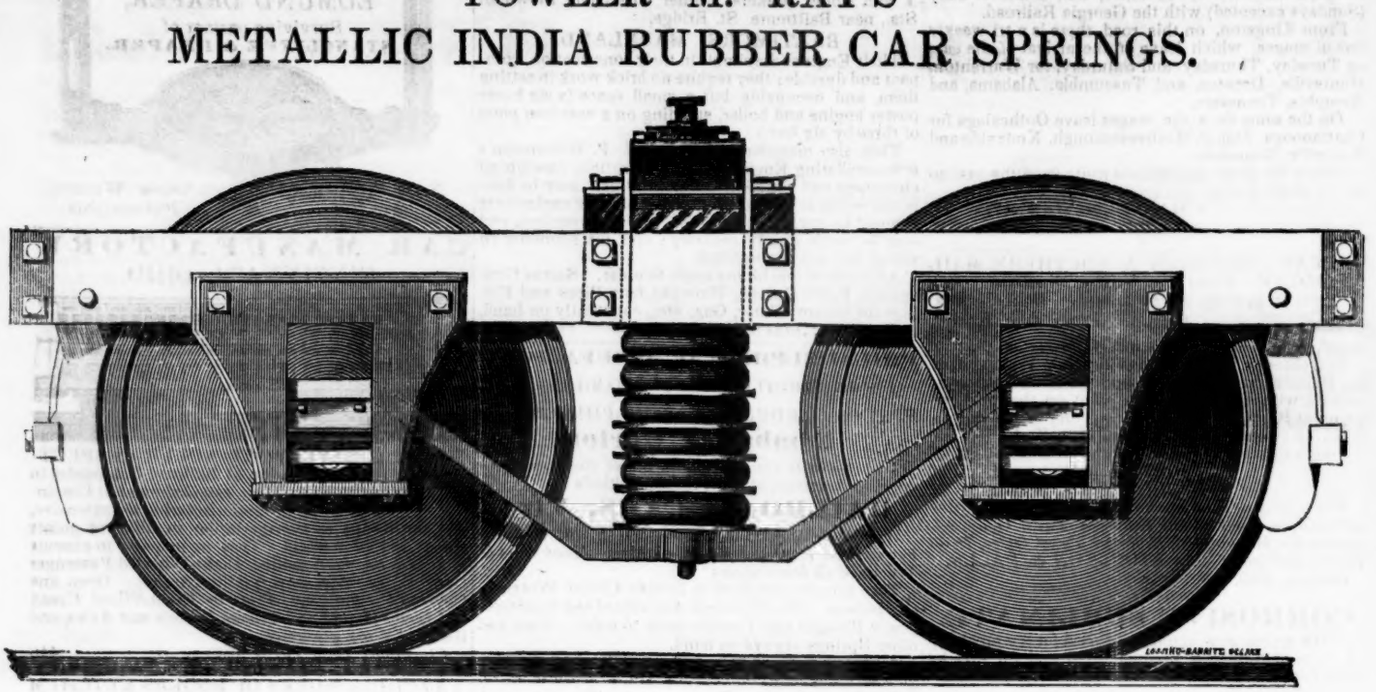


Fig. 1.

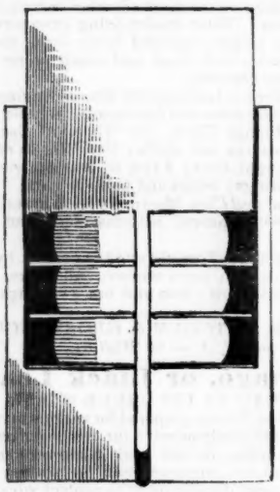


Fig. 2.

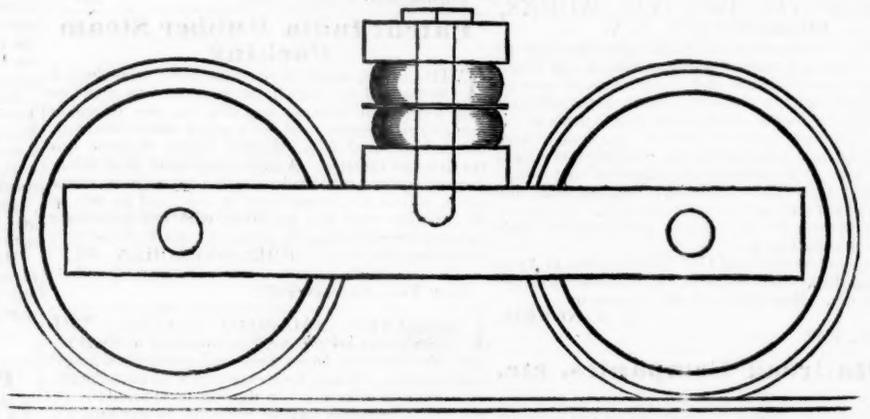
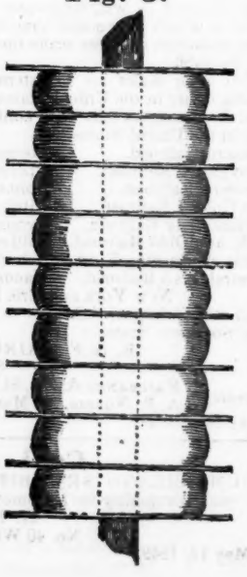


Fig. 3.



So much has been published for the purpose of misleading the public in regard to the inventorship of the India-rubber Railroad Spring, patented in the United States by Mr. W. C. Fuller, that the New England Car Company, proprietors of this invention, have deemed it proper, for the information of Railroad Companies, Car Builders and the public generally, to lay before them the facts upon which they found their claim to this invention, and to a Patent therefor.

Cut No. 1, Represents a cross section of the first model made by Mr. Tucker, under the direction of Mr. Ray, in the summer of 1844, and to which Mr. Tucker, Mr. Bradley and Mr. Bannester testify as being the model marked "B."

Cut No. 2, Represents the model made in 1845, to which Mr. Osgood Bradley and Gen. Thos. W. Harvey have testified.

Cut No. 3, Represents a rough sketch made by Mr. Ray in 1844, which he gave to a man about departing for England to take out some patents, who promised to write to Ray after his arrival in that country—which promise he has probably forgotten.

Mr. W. C. Fuller, of England, patented the above Spring in that country on the 23d October, 1845. He filed his enrollment April 23d, 1846, and on the 22d October, 1846, he took out a patent in the United States under the title, "For Improvement in Railway Carriages," when the improvement consisted in the spring, and not in the carriage.

The reader will perceive by the annexed testimony, that the India-rubber Railroad Car Spring was invented by Mr. Ray about two years previous to the date of Mr. Fuller's enrollment.

The Depositions are omitted for want of room, but will be published in full in the course of a few weeks.

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